**Universidade de Aveiro** Departamento de Línguas e Culturas
**2009**

**Heidy Christina Gonçalves**

# Exploring ESP in Electronic Engineering and Telecommunications

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# Um Estudo de Inglês para Fins Específicos na Área de Engenharia Electrónica e de Telecomunicações

Dissertação apresentada à Universidade de Aveiro para cumprimento dos requisitos necessários à obtenção do grau de Mestre em Estudos Ingleses, realizada sob a orientação científica da Professora Doutora Maria Teresa Costa Gomes Roberto, Professora Auxiliar do Departamento de Línguas e Culturas da Universidade de Aveiro

**O Júri**

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**Acknowledgements**

I owe my deepest gratitude to Professora Doutora Maria Teresa Costa Gomes Roberto for being the source of inspiration, energy and, of course, knowledge in this whole project. Her unflinching courage, strength, and confidence will always inspire me. To her I dedicate this thesis.

I am grateful to Professor Doutor Armando José Formoso de Pinho for his enlightening contribution. This project owes its very own existence to all the students, engineers, professors and friends who so kindly answered my questions and made me ask some more.

My friends and family always stood by my side asking over and over again "When will you get it done? Next week? Next Month? When?". Thank you for putting up with me, pampering me and loving me forever and a day...

My final words go to my mother, João, and to all of the people who teach me how to laugh, how to love and how to believe. Thank you always...

**Keywords**

ESP in Telecommunications, Needs Analysis, Language skills, Communicative contexts

**Abstract**

This study discusses the application of English for Specific Purposes for Telecommunications and its use in an academic and professional background. Keeping this in mind, I will apply the research on the academic and professional discourse communities. The methodology will be based on Needs Analysis and will be applied on the discourse communities related to Electronic Engineering and Telecommunications.

The findings from this research will contribute to the work of ESP teachers, scientific and technology professors, and especially the students and engineers in this area, in the sense of making the learning process much simpler and effective.

**Palavras chave**

Inglês para Fins Específicos em Telecomunicações, Análise das necessidades, Competências linguisticas, Contextos de comunicação

**Resumo**

Este trabalho de investigação situa-se no âmbito da problemática da utilização do Inglês na expansão das Telecomunicações e das implicações que a língua inglesa tem, a nível académico e industrial, nesta especialidade.
Partindo desta problemática irei proceder ao estudo da comunidade académica e profissional. O estudo desta comunidade visa compreender as necessidades específicas de aprendizagem no âmbito do Inglês para Fins Específicos, na área da Engenharia Electrónica e de Telecomunicações.

Os resultados da investigação permitirão fornecer aos professores de *ESP* e aos docentes de disciplinas de formação científica e tecnológica, e aos próprios estudantes e profissionais nesta área, uma contribuição para uma aprendizagem efectiva do Inglês neste âmbito.

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# Abbreviations

**ACIST** - *Associação de Comerciantes e Instaladores de Sistemas de Telecomunicações*

**ANACOM** – *Autoridade Nacional de Comunicações*

**APDC** - *Associação Portuguesa para o Desenvolvimento das Comunicações*

**APT** - Anglo-Portuguese Telephone Company

**CDMA** - Code Division Multiple Access

**CNP** - Communication Needs Processor

**CTT** - *Correios, Telégrafos e Telefones*

**EAP** – English for Academic Purposes

**EBE** - English for Business and Economics

**ELT** – English Language Teaching

**EOP** – English for Occupational Purposes

**ERASMUS** - European Community Action Scheme for the Mobility of University Students

**ESP** – English for Specific Purposes

**ESS** - English for Social Studies

**EST** – English for Science and Technology

**EVP** - English for Vocational Purposes

**GE** - General English

**GSM** - Global System for Mobile Communications

**HSDPA** - High Speed Downlink Packet Access.

**ICP** - *Instituto das Comunicações de Portugal*

**IEETA** - Institute of Electronics and Telematics Engineering of Aveiro

**IP DSLAM** – Internet Protocol Digital Subscriber Line Access Multiplexer

**LSP** – Language for Specific Purposes

**MTS** – Mobile Telephone Service

**MVNO** - Virtual Mobile Network Operator

**NA** – Needs Analysis

**NGN** - Next Generation Network

**PSTN** - Public Switched Telephone Network

**SL** – Second Language

**SME** - Small and Medium-Sized Enterprises

**TALO** - Text as a Linguistic Object

**TAVI** - Text as a Vehicle of Information

**TESOL** - Teachers of English to Speakers of Other Languages

**TMN** - *Telecomunicações Móveis Nacionais*

**UMTS** - Universal Mobile Telecommunications System

**WWW** – World Wide Web

# Introduction

> *…But it (English) will always be highly desirable, and let me close with a story from the early days of the telephone. It's a famous legend in the prehistory of the bell system.*
>
> *A linesman had just installed the first telephone ever seen in a remote area of New Jersey, and when he'd finished, a farmer came up to him and asked anxiously, 'Can I talk through it in Italian?'*
>
> *The linesman looked at him with annoyance. 'You should have asked me that before', he said. Now I'll have to put in a third wire – and it will cost you another fifty bucks'.*
>
> *I think the lesson is obvious. If you know English, you won't have to pay extra. (Clarke in Baumgardner & Chamberlain, 1988: 8)*

The English language has been shaped by the effects of innovation ever since the industrial revolution, but innovation and technology have also been shaped by the English language. As English became the world's language of breakthrough and as rapid advances were made in science, engineering, manufacturing and communications, new and more complex communicative functions were required of the language.

The usefulness and the feasibility of this project is not only a part of a linguistic investigation, but it is also an investigation in the area of English for Science and Technology (EST), specifically for Electronics and Telecommunications.

As David Graddol stated:

> *Networks potentially change cultural and economic landscapes, condensing distance and overcoming barriers to communication. And the interconnectedness of cultural and decision-making systems, facilitated by one-to-one communication, has produced a 'complex system' capable of unpredictable cultural and economic shifts. (Graddol, 1997: 31)*

This project will approach the fact that technology has become essential to culture and language in the same way that language (English) and culture has contributed significantly to technology. The leading language of technology, in particular computers and

information technology or telecommunications, has been English, mainly because the majority of innovation research and development is focused in the United States of America. Additionally, the documentation and conferences, in which research findings are reported, are in English and it has become a facilitator through which researchers inform and are informed of the different developments.

Furthermore, English seems to be intrinsic to this period of global change: the change in the global economy, telecommunications networks and educational curricula, since it is fundamental to the needs of students, workers and employers. In fact, with globalization and the rapid explosion of information technologies, there has been an explosion in the demand for English worldwide.

> *This has led to greater diversification in the contexts and situations in which it is learned and used, as well as in the nature of the language itself. English is increasingly diverse and a diversified resource for global communication. (Carter & Nunan, 2001: 2)*

Globalisation changes the conditions under which language learning takes place. The most significant changes are economic and people have always learned languages for economic reasons. The technological change is connected to this economic change, since the business of the global markets depends on the rapid information flows made possible by new information and communication technologies.

> *It may take a militarily powerful nation to establish a language, but it takes an economically powerful one to maintain and expand it. (Crystal, 1997: 10)*

This has been the case with English and an important factor early in the twentieth century, with economic developments beginning to operate globally, supported by the new communication technologies – telegraph, telephone, radio – which speed the emergence of massive multinational organizations. The boom of competitiveness and business brought an explosion of international marketing and advertising. The drive to make progress in science and technology fostered an intellectual and research environment which gave research and further education a high profile.

Great Britain was the world's leading industrial and trading country in the beginning of the nineteenth century. Moreover, the population of the United States of America was larger

than any of the countries of Western Europe, and its economy was the most productive and the fastest growing in the world by the end of the century. British political and economic imperialism spread the English language all over the world during the nineteenth century. During the twentieth century, this world was introduced to the power of the English language and has not yet recovered from its economic supremacy: 'the language behind the US dollar'.

Economic globalisation is a term referring to the fact that trade, investment and technology links are increasing worldwide as is the number of countries which are open to world markets. In addition to this, the liberalization of telecommunications – and the rise of the internet which creates a truly global market place – has created new opportunities for the international exchange of information and services. Countries are able to establish a technological and commercial front in advanced telecommunications and computer technology, which are not only in a favourable position to exploit new opportunities, but they can also shape the global economic order.

> *"No futuro, os novos aparelhos técnicos serão talvez tão inseparáveis do homem como a casca do caracol ou a teia da aranha." (Heisenberg in Silva, 1999: 53)*

This project focuses on the globalisation of Telecommunications, as well as its repercussions in the academic and professional world. Among the most important factors of globalisation there are: the numerous discoveries and applications of new technologies, the foundation of world markets of various products, the increase of international interconnection between people, communities, enterprises and governments, and, lastly, the growth of new manifestations of identity and culture. The English language has developed into an important role in each part of globalisation. Otto von Bismarck, the famous German chancellor, once predicted the economic and technological hegemony of the United States of America, by stating in 1898, that the most crucial factor of modern history was that "the North Americans speak English".

So, he summarized the linguistic supremacy that the language would come to have, especially in the area of this study, electronics and telecommunications.

I have decided to develop this project on the assumption that, as in innovation, the English language has become the key to success for industrial and national economy and particularly, for the ability to manage this economy and the fast changes of the world today. Innovation growth is sustained by innovation change, so the new and advanced technologies (informatics, space and telecommunications) have made information exchange, software and hardware transfer of humans and services possible and even expandable. It allows for better satisfaction of individual and collective needs. It is 'per se' an international globalized activity (Corsi & Kudrya, 1996: 17). The same occurs with the English language, which has in its primary objective communication.

Furthermore, I am also determined to study this theme, English for Specific Purposes for Electronics Engineering and Telecommunications, because I did not find specific studies in this area in Portugal and I obviously wanted to help teachers, in ESP or scientific subjects, students and professional engineers by developing materials or strategies that can be useful in their academic and professional lives.

Various researchers studied different types of students and their specific needs when teaching English for Specific Purposes (ESP), which comprises other areas such as English for Academic Purposes (EAP) and English for Occupational Purposes (EOP). The political and economic changes in the global world have also demanded an increase in material for the specific area of English for Science and Technology (EST).

In terms of the Portuguese setting, research development in this area has not been consentaneous with the specific needs of English language teachers. Consequently, General English (GE) is mostly used for specific purposes. The scientific magazine, *Confluências*, has brought some attention to this subject, essentially, to the learner's specific needs and their motivation, which are two fundamentals in English for Specific Purposes. Therefore, I hope to develop an analysis of the learner's specific needs and the needs of professionals of Electronics Engineering and Telecommunications.

Many of the engineers who majored in Electronics Engineering at the University of Aveiro currently occupy important positions, not only in the job market, but also in the areas of education and research. Fortunately, there are many job offers related to technical help and management in public and private companies, and in a variety of other areas:

telecommunications (e.g. mobile telephones), information technology (software projects or programming), automation, robotics, etc., or project offices, consulting companies, teaching and research at universities, polytechnic institutes, or investigation and innovation institutes.

One of the main reasons I chose to base my study on the area of Telecommunications was due to the fact that there is a non-profit organisation, based in Aveiro, named *Inova Ria* that contributes to the establishment and consolidation of the telecommunications industry in this region, sponsoring the regional development and competitiveness. Among its members, the presence of companies such as NEC Portugal, Nokia Siemens Networks, Ericsson and *Portugal Telecom Inovação* must be highlighted. Nevertheless, the majority of the associates are Small and Medium-sized Companies, active in delivering Telecommunications and Information Systems products and services. The objectives of this association include the endorsement of innovation, the collaborative effort in research and development, training, marketing and internationalisation and managing the appeal of investment to the region. This combination of favourable ingredients drew me to this study: the existence of a university with strong credits in telecommunications, the presence of strong industrial corporations in this area in Portugal and, consequently, the need to draw attention to ESP in engineers' education.

Moreover, the technological evolution has forced the companies to develop faster and more efficient means to communicate. In this way, the English language has become vital, since most companies communicate in English. As I have mentioned the reasons for its increasing relevance is because English has changed from simply being another foreign language into having become a universal form of communication in all occupations. Hence, my major objective is to contribute to the development of telecommunications by improving the teaching and learning of ESP.

This work is divided into four chapters which discuss in detail the stages that I went through in order to explore the applicability of the theoretical framework chosen, namely the bringing together of English for Specific Purposes (ESP) and Needs Analysis (NA) and its consistency in the Telecommunications field. These *needs* are related to the specific tools, skills and linguistic contexts that students and engineers are exposed to in their academic and professional lives.

In chapter I, there is a contextualisation of the different settings I worked in, which is the relevance of Globalisation and Telecommunications in the development of this study. I bear in mind the relationship between students' and engineers' learning needs in relation to their professional settings. Therefore, I discuss the global setting which learners are a part of, that is, the importance of Globalisation in English Language Learning.

Chapter II explores and discusses the reasons why Genre Theory and Needs Analysis (NA) allow the ESP teacher to gain a better insight into the communicative contexts of the target professional communities which the students will be a part of, and why it is relevant from the point of view of language learning. This chapter also highlights the relationship between ESP, Register Analysis and Genre Awareness as an empowerment tool.

Chapter III addresses the methodology adopted to carry out this work, namely the reasons in choosing questionnaires to obtain a profile of each student, engineer and professor, as well as their needs and expectations regarding their English skills and competences. This chapter also provides their profiles, the analysis and discussion of the consequences of such information for the development of a future course syllabus.

The aim of the last chapter is to show in what way the central objectives of this study were attained and how the methodology adopted in this study helped answer my research questions. I will also highlight the answers that I obtained through the questionnaires which were related to the very specific needs of my respondents: students, engineers and teachers, bearing in mind their specific roles in varied professional settings. This chapter also provides a future insight, through the information obtained, towards the development of a syllabus and the importance of specific language learning as a means of becoming a successful professional in the job market.

# Chapter I – Contextualization and Relevance of this Study

> "To be sure, an ordinary passerby would think that my rose looked just like you --the rose that belongs to me. But in herself alone she's more important than all the hundreds of you other roses: …"
>
> *The Little Prince* - Antoine de Saint Exupéry

There is very little research in the Telecommunications sector in Portugal in terms of teaching the English language in a professional and industrial context, such as the type of communication used among professionals and issues related to text types, I will study these factors throughout my work and try to fill in this void.

In terms of ESP research, Needs Analysis helps teachers transfer to students what is really important and immediately necessary in the professional world. One of the main objectives of ESP is to teach text types, because it will satisfy the needs of students and professionals who have to use specific text types and communicative situations, in particular, academic and professional contexts. This method will compensate a considerable limitation in the area of English Language Teaching (ELT), as many authors have verified, such as Johns & Dudley-Evans (1991), Thompson (1994), St. John (1996), Robinson (1981) and Ellis & Johnson (1994). The methodology that I have decided to apply and analyze during my project is the detection of the learner's needs through the application of an interview and questionnaires. I used the questionnaires in order to identify the overall profile and learning needs of the students in the course of Electronics Engineering and Telecommunications of the University of Aveiro, specifically the second and fifth year students. The questionnaires also aim to distinguish the profiles, as well as the needs and expectations of different Portuguese and foreign companies within the area of Telecommunications in

terms of communicating through the English language. The second stage of my research was to identify and contact the subjects and potential respondents. Letters were sent to the director of the course -Electronics Engineering and Telecommunications-, several professors teaching the course and every Telecommunications company in the country in order to ask for their permission to participate in the research. After receiving the replies, I had a total of 39 responses from students, eight from professors, and 21 from engineers, which made up the approximate representation of my universe. Once I obtained my subjects, and later gathered and analysed the information, I could speak with some clarity about the views and circumstances of the respondents. However, there is still a degree of uncertainty about how far this applied to the community as a whole. In practice, the number of respondents was largely determined by the amount of data I could cope with and I am still aware of my constraints, so I intend to exercise caution in generalising about the whole community.

In general, I hope to:

a) Contribute to the development of Telecommunications by improving the teaching and learning of ESP;

b) Minimize the learning difficulties and the communicative boundaries in the academic and professional settings of Telecommunications, by facilitating the learning process and, therefore, the innovation growth in this area;

c) Identify and analyse the learner's specific needs of second and fifth year university students of the University of Aveiro, and engineers working in various Telecommunications companies in Portugal.

d) Determine and study the different opinions of university professors of the University of Aveiro in terms of English for Specific Purposes for Telecommunications;

e) Contribute to promoting the creation of various conditions that will facilitate the communication between Portuguese professionals and those of other countries, as well as international organizations and associations, by improving the cooperative communication namely in the areas of Training, Cooperation, and Internationalisation.

This thesis is an attempt to reflect and discuss the present international context and the basis of language learning. The call for the new theories and methodologies in the area of language teaching and learning has to do with the political, economic and social motivations that have changed the demands made on the individual's communicative competence in a foreign language.

Consequently, I decided to divide this chapter into two distinct fields of discussion: Globalisation and Telecommunications. The second section explores the role of Globalisation in the process of language learning, as language is a facilitator in the process of global economical and technological exchange.

## 1.1. Globalisation and Language

Globalisation is probably the most significant socio - economic process affecting the world in the late 20$^{th}$ century. Its effects are felt not only in the economy, but also in politics and culture. Discussions of globalisation usually emphasize the importance of local contexts, for globalisation creates patterns of interdependence and interconnection, where cultures and economies influence each other rapidly, but in complex and often unpredictable ways.

Globalisation is proceeding differently in diverse industries, driven primarily by: increasingly similar demands of users for global products; changing needs and capabilities of global costumers; underlying economies of scale and scope in research, product development, and manufacturing; and the traditional differential costs of input factors. Technology is as a result both driven by, and a key driver of, globalisation.

For an example of how globalisation and technological innovation continually reinforce one another I only need to look at the way information technology and telecommunications are reshaping competitive landscapes and radically changing how both individuals and firms work together throughout the world.

People have, in short, become more mobile, both physically and electronically. There is no nation now which does not have some level of accessibility using telephone, radio, television, Internet, electronic mail and air transport. As the innovations made their impact

on the United States of America, the amount of expository material in the English language increased.

Additionally, due to the significant mobility nowadays, competition for students and academics is becoming fiercer. There is a noteworthy correlation between national economic prosperity and rapid expansion of higher education.

Within Europe, the *Bologna Process*[1], typically presented by its 45 signatories as a cultural understanding to create a borderless and democratic European Higher Education Area, is in some respects a response to the international marketization of tertiary education. The conclusion is that: English is the language of science. That is the language we have to use if we wish to prepare our students for an international career in a globalizing world.

The extent of foreign language learning in the curriculum at primary and secondary level, and the level of language learnt, are striking. In Europe, the most recent survey finds that "English is the most taught language in virtually all countries…Furthermore, in both primary and secondary education its dominant position is becoming even stronger." (Eurydice, 2005a: 11) At a tertiary level, Graddol has described the global trend and its socio - cultural and economic consequences:

> *One of the most significant educational trends world-wide is the teaching of a growing number of courses in universities through the medium of English. The need to teach some subjects in English, rather than national language, is well understood: in the sciences for example, up-to-date text books and research articles are obtainable much more easily in one of the world languages and most readily of all in English. (Graddol, 1997: 45)*

At the same time, developing countries become exporters of educational services. Also on the positive side, in formal international scientific settings, English facilitates global academic exchange, advancement of knowledge, and career advancement and mobility.

If language is a truly international medium, it is going to be most apparent in those services which deal directly with the task of communication – the postal, telephone and mobile

[1] The Bologna Process is the major contributor to the process of integration of European Higher Education, in line with the objectives of the Lisbon Declaration to make Europe the most competitive economy in the world.

systems. The distribution of information from one location to another is the role of the communication system as is the role of the English language in the world. Therefore, English is the medium of a great deal of the world's knowledge, especially in such areas as science and technology. As a result, more people in a wider variety of jobs require greater competence in English.

Harry Mashabela (South African writer) once stated:

> *…learning and using English will not only give us the much-needed unifying chord but will also land us into the exciting world of ideas; it will enable us to keep company with kings in the world of ideas and also make it possible for us to share the experiences of our own brothers in the world… (Mashabela in Crystal, 1997: 110)*

## 1.2. Telecommunications

This era is often referred to as the information age. An age in which the uproar of the Internet and the emergence and consolidation of the World Wide Web (WWW), the most interactive and fastest growing segment of the Internet, has spawned enormous growth in technologies, standards and products beyond anyone's imagination. The era in which we live in has rapidly transformed the office and factory worker into an analyser, manipulator, gatherer, and distributor of information. Telecommunications has brought millions of computers together to share their endless capabilities for providing information. Nowadays, the education system, business, jobs, entertainment and very often, everyday tasks need skill in the use of information systems.

Telecommunications is the process of distributing information, as the prefix *tele-* is derived from the Greek meaning for 'at a distance'. Telecommunications is defined as a type of communication using technical media to exchange sound and information – in the form of speech and text -over large distances. The telephone network forms the backbone of existing telecommunications infrastructures. The telephone, telex, and telegraph consist of networks that use circuit switching. This means that there is a permanent tie-up between all points connected to the network. A large-scale point-to-point network transmitting signals by both cable and air brings this about. (Corsi & Kudrya, 1996: 31)

## 1.2.1. The History of Telecommunications in the World

Telecommunications technology is surprisingly old. Already in the 1870's, the world was linked by the electric telegraph and along these wires the English language flowed. The Victorian network was almost entirely owned and operated by British companies and London was the communication centre for most of the world's long-distance cables. The social and commercial implications of this kind of technology were widely debated and by the end of the 19th century, it was typical to speculate about the 'the annihilation of space and time'. Since then, improved technology has emerged that has shaped global patterns of communication and may continue to impact on language flow and use. (Dijk, 1999: 31)

Historically, telecommunications encompassed the telegraph system, invented by Samuel Morse in 1854. Information was transmitted (and still is) as a series of electrical impulses generated by pressing a hand key. To be able to communicate over such a long distance with the telegraph system was, at the time, a scientific marvel. The invention of the telephone by Alexander Graham Bell in 1876 led to the growth of the telephone system, which further extends the ability to communicate 'at a distance'. Many milestones were yet to follow, each contributing to our ability to communicate over long distances. Telephone networks began to expand nationwide. Television and radio broadcasts spanning to the globe via satellite communications were added to the solid growth of an industry: the telecommunications industry, one of the largest and fastest growing industries in history. Telecommunications have come to be regarded as long – distance communications via a conglomeration of information-sharing networks all tied together. These include the *public switched telephone network (PSTN),* data communication networks, radio and television networks, and the most important, the fibre that is destined to virtually link all communication systems together: the Internet and the World Wide Web (WWW). During the 1990's, the completely digital mobile telephony network of Global System for Mobile Communications (GSM) was introduced on an international scale, first of all in Europe. The mobile telephony made a breakthrough in places with high communication density like companies, offices and cities, and in places with few fixed lines such as rural areas and developing countries. (Dijk, 1999: 32)

The socio- economic impact resulting from the telecommunications era has caused an increase in worldwide productivity through the automation of engineering, manufacturing, and office activities. Clearly, the advances in telecommunications in the years to come will warrant considerable effort on the part of the technologist to keep side by side to the enormous changes that will take place. In this work, I will study the importance of Telecommunications and English, so vital to technological and educational growth.

## 1.2.2. The History of Telecommunications in Portugal

In 1877, only a year after the discovery of the telephone by Alexander Graham Bell, the first experiences with this device occurred in Portugal, linking Lisbon and *Carcavelos* to the observatories of the Polytechnic Institute and *Tapada da Ajuda*, both connections were located in the capital. Five years later, the private company Edison Gower Bell (later changed to the Anglo-Portuguese Telephone Company - APT) implemented the first public networks in the cities of Lisbon and Oporto. In 1904 and 1905, new networks spread to other parts of the country, such as Coimbra, Braga and Setúbal, through the new state company, *Correios, Telégrafos e Telefones (CTT)*. In the early years, the telephone was still scarcely used by companies, merchants, and liberal professions in spite of the good quality of the existing telegraph service. After 1904, a set of more modern telephone networks was established all over the country, as well as the official connection between Lisbon and Oporto on 11$^{th}$ April of that year. After 1930, the first automatic telephone exchange was created at APT, leaving behind the work of operators, who were essential elements in communication up until this time. After the decline in telecommunications felt during the Second World War (1939-1945), their use increased surprisingly during the 1950s, 1960s and 1970s. The telephone networks were automated all over the country and islands by the year 1985. The first digital telephone exchange was settled in Lisbon (Carnide) and Aveiro in 1987 at the time of the first digitalization of telephone switching.

In the 1990s, telecommunications began working based on different operators that still compete amongst themselves. The first mobile phones appeared and *Telecomunicações Móveis Nacionais (TMN)* was the first operator to appear. After this, *Telecel* and *Optimus*,

the latter was licensed in 1997, made up the three leading operators in the telecommunications market in Portugal. The most successful of the operators' products were 'Mimo' *(TMN)* and 'Vitamina' (Telecel). Regarding the Internet, *Telepac* began its activity in 1985, and it was market leader in the transmission of data and the Internet. Its product 'Netpac' became an enormous success at that time. Nowadays, there are four competitive mobile operators, such as CTT - *Correios de Portugal*, S.A., SONAECOM - *Serviços de Comunicações, S.A.* (*OPTIMUS*), TMN - *Telecomunicações Móveis Nacionais, S.A.* and VODAFONE PORTUGAL - *Comunicações Pessoais, S.A.* The CTT - *Correios de Portugal, S.A.*, have provided the Mobile Telephone Service (MTS) in the form of a virtual mobile operator (MVNO) and services such as *Phone – ix* and *UZO*.

**ANACOM**

The *Instituto das Comunicações de Portugal* (ICP) began its activity, as a state institution in November of 1989. In 2002, with the entry to force of the new statutes, it became the *ICP – Autoridade Nacional de Comunicações* (ICP-ANACOM), better known as *ANACOM*. Nowadays, ANACOM is a model of independent administrative authority that is separated financially and functionally from the Portuguese government. It has a vast universe of duties and responsibilities that are deliberated by the *Lei de Bases dos Serviços Postais* and other complementary legislation.

The ICP - *Autoridade Nacional de Comunicações* (ANACOM) is the national regulatory authority of the communications sector- telecommunications and mail - in Portugal. It is an institution dedicated to promote free competition, and transparency in prices and conditions of service usage, as well as the development of markets and communications networks. Its main objective is to defend the consumers' interests, particularly communications users, and it assures market supervision, as well as the access to universal services not only in electronic communications but also in postal services.

Other associations are dedicated to the research and development of communications and telecommunications in Portugal:

- *Instituto de Telecomunicações*
- *Instituto das Comunicações de Portugal*

- *Centro de Estudos de Telecomunicações*
- *Associação de Comerciantes e Instaladores de Sistemas de Telecomunicações (ACIST)*
- *Associação Portuguesa para o Desenvolvimento das Comunicações (APDC)*
- *Apritel - Associação dos Operadores de Telecomunicações*
- *Sindicato Nacional dos Trabalhadores das Telecomunicações e Audiovisual*
- *Associação dos Operadores dos Correios e Telecomunicações dos Países e Territórios de Língua Oficial Portuguesa*

In general, discussions of globalisation, the Internet, and Telecommunications typically emphasize the increasing pace of change in the globalized world today. Progress in telecommunications technology has had, and will continue to have, an enormous impact on telecommunications manufacturing and service industries. As I have mentioned before, because telecommunications are now indispensable to socio-economic activities and globalisation, I will link them to English language learning in a Portuguese academic and professional context.

# Chapter II – Theoretical Framework

> "… because it is she that I have watered; because it is she that I have put under the glass globe; because it is for her that I've killed the caterpillars (except the two or three we saved to become butterflies); because it is she that I have listened to, when she grumbled, or boasted, or even sometimes when she said nothing. Because she is MY rose."
>
> *The Little Prince* - Antoine de Saint Exupéry

The main objective of this chapter is to discuss the theoretical framework chosen for this study in order to describe the needs analysis of students and engineers of the Electronics and Telecommunications course at the University of Aveiro. Therefore, I have divided the chapter into three sections. Here, the main guidelines of my research are presented, their purpose being to justify and reinforce the important role played by Needs Analysis in the area of ESP. I also chose to look into the study of Genre Theory and the Register Analysis in order to better analyse the data obtained in the following chapter, Methodology, as well as demonstrate how Register Analysis will help students and engineers in their communicative endeavours.

## 2.1. English for Specific Purposes

### 2.1.1. What is ESP?

As Tony Dudley-Evans and Maggie St. John (Dudley-Evans, 1998) put it, English for Specific Purposes (ESP) is an approach to the language learner that is centred on the language appropriate to the activities of the discipline it serves in terms of grammar, lexis, register, study skills, discourse and genre.

As for a broader definition of ESP, Hutchinson and Waters state (1987: 19),

> *ESP is an approach to language teaching in which all decisions as to content and method are based on the learner's reason for learning.*

English for Specific Purposes (ESP) has been a separate branch of English Language Teaching (ELT) for about 30 years. It has developed its own approaches, materials and methodology and is generally seen as very active and has had considerable influence on the more general activities of Teachers of English to Speakers of Other Languages (TESOL) and applied linguistics.

ESP led teachers to a needs-based syllabus design and to the emergence of differentiated courses to match the different needs of learners. Courses in which the goals, objectives and content are matched to the communicative needs are known as English for Specific Purposes (ESP) courses. They are further differentiated into courses in English for Academic Purposes (EAP), English for Science and Technology (EST), etc. These branches of ESP will be discussed further on in this study.

### 2.1.2. The History of ESP

There are especially three reasons common to the emergence of all ESP: the demands of a "Brave New World", a revolution in linguistics, and focus on the learner (Hutchinson & Waters, 1987: 6).

Hutchinson and Waters report that there were two key historical periods in the life of ESP. First, the end of the Second World War brought an:

> *(...) age of enormous and unprecedented expansion in scientific, technical and economic activity on an international scale for various reasons, most notably the economic power of the United States in the post-war world, the role [of international language] fell to English. (Hutchinson & Waters, 1987: 6).*

Second, the Oil Crisis of the early 1970s resulted in Western money and knowledge flowing into the oil-rich countries. As I have mentioned in the section on globalisation of this study, the language of this knowledge became English.

The general effect of this development was to apply pressure on the language teaching profession in order to deliver the required skills and linguistic competences. Whereas English had previously decided its own destiny, it now became subject to the wishes, needs and demands of people other than language teachers (Hutchinson & Waters, 1987: 7).

Another reason cited as having a tremendous impact on the emergence of ESP was a revolution in linguistics. Whereas traditional linguists set out to describe the features of language, revolutionary pioneers in linguistics began to focus on the ways in which language is used in real communication. Hutchinson and Waters (1987: 75-76) point out that one significant discovery was in the ways that spoken and written English vary. In other words, given the particular context in which English is used, the variant of English will change. If language in different situations varies, then manoeuvring language instruction to meet the needs of learners in specific contexts was also possible. Therefore, in the late 1960s and the early 1970s there were many attempts to describe English for Science and Technology (EST). Hutchinson and Waters (1987) identify Jack Ewer and G. Latorre, John Swales, Larry Selinker and Louis Trimble as a few of the EST pioneers.

Hutchinson and Waters (1987) believed that instead of simply focusing on the method of language delivery, more attention should be given to the ways in which learners obtain language and the differences in the ways language is obtained. Learners were supposed to adopt different learning strategies, use different skills, enter with different learning plans, and be motivated by different needs and interests. Therefore, focus on the learners' needs became equally paramount as the methods employed to spread linguistic knowledge. Designing specific courses to better meet these individual needs was a natural extension of this way of thinking. To this day, the buzzwords in ESL circles are *learner-centred* or *learning-centred*.

Peter Strevens defined ESP by identifying its *absolute* and *variable* characteristics. This definition makes a distinction between four absolute and two variable characteristics:

I. Absolute characteristics:

ESP consists of English language teaching which is:

- designed to meet specified needs of the learner;

- related in content (i.e. in its themes and topics) to particular disciplines, occupations and activities;

- centred on the language appropriate to those activities in syntax, lexis, discourse, semantics, etc., and analysis of this discourse;

- in contrast with General English.

II. Variable characteristics:

ESP may be, but is not necessarily:

-restricted as to the language skills to be learned (e.g. reading only);

-not taught according to any pre-ordained methodology (Strevens, 1988: 1-2).

At a 1997 Japan Conference on ESP, Dudley-Evans offered a modified definition of these absolute and variable characteristics. The revised definition is:

I. Absolute Characteristics

ESP is defined to meet specific needs of the learner;

ESP makes use of the underlying methodology and activities of the discipline it serves;

ESP is centred on the language (grammar, lexis, and register), skills, discourse and genres appropriate to these activities.

II. Variable Characteristics

ESP may be related to or designed for specific disciplines;

ESP may use, in specific teaching situations, a different methodology from that of general English;

ESP is likely to be designed for adult learners, either at a tertiary level institution or in a professional work situation. It could, however, be for learners at secondary school level;

ESP is generally designed for intermediate or advanced students. (Dudley –Evans, 1998: 4)

Dudley-Evans and St. John have removed the absolute characteristic that "ESP is in contrast with General English" and added more variable characteristics. They asserted that ESP is not necessarily related to a specific discipline.

### 2.1.3. Types of ESP

In the "Tree of ELT" (Hutchinson & Waters, 1987: 16-18), ESP is broken down into three branches: a) English for Science and Technology (EST), b) English for Business and Economics (EBE), and c) English for Social Studies (ESS). Each of these subject areas is further divided into two branches: English for Academic Purposes (EAP) and English for Occupational Purposes (EOP). An example of EOP for the EST branch is 'English for Technicians' whereas an example of EAP for the EST branch is 'English for Electronics Studies'. English for Science and Technology encompasses a whole range of language features that an engineer, for example, may have to face during his/her professional life.

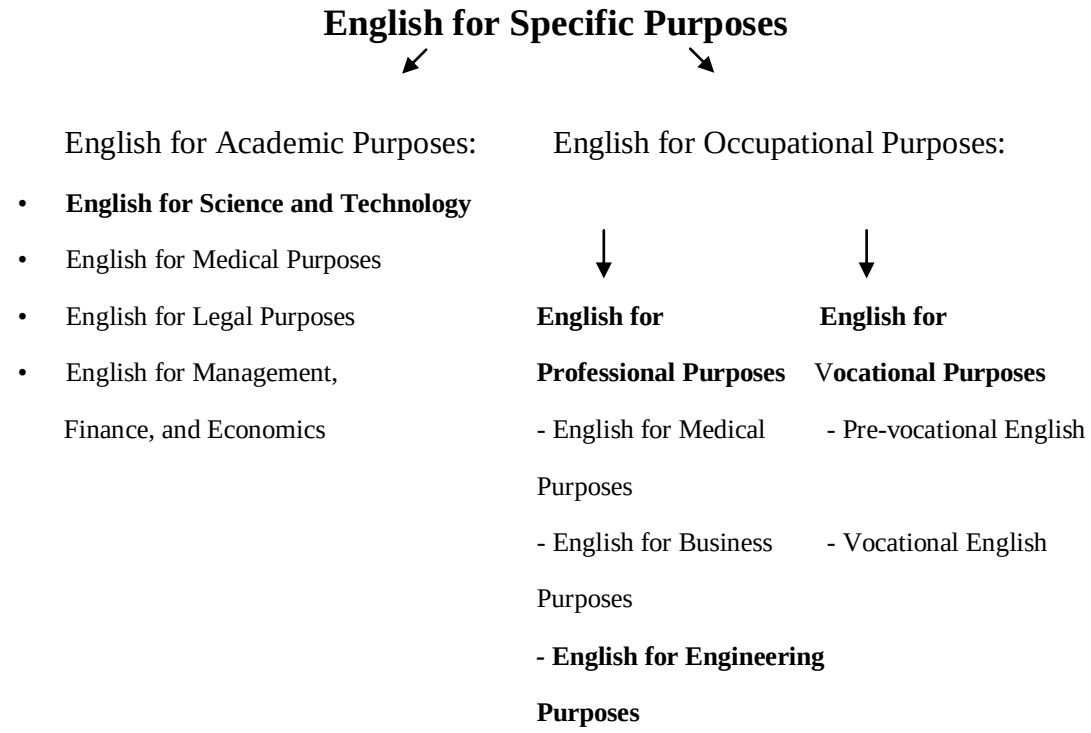
Hutchinson and Waters noticed that there is not an absolute distinction between EAP and EOP:

> *(...) people can work and study simultaneously; it is also likely that in many cases the language learnt for immediate use in a study environment will be used later when the student takes up, or returns to, a job. (Hutchinson & Waters, 1987: 16).*

This situational language has been determined based on the interpretation of results from needs analysis of authentic language used in target workplace settings. English for Academic Purposes (EAP) relates to the English needed in an educational context, usually at a university or similar institution, and possibly also at school level. English for Occupational Purposes (EOP) relates to professional purposes, e.g. those of working doctors, engineers or business people (Hutchinson & Waters, 1987: 16).

I will approach both of these branches in this study. I will show that English for Academic Purposes and English for Occupational Purposes share overlapping goals, in which EAP, lays the groundwork for the latter, in the practical application of acquired language skills. The following figure represents the classification of EST in ESP from both of these perspectives: EAP and EOP.

**Figure 1 - Classification of EST in ESP**




Source: Dudley – Evans, T. & St. John, M., 1998: 6

Dudley- Evans and St. John confirmed that in English for Vocational Purposes (EVP), there are two sub – sections: Vocational English, which is related to the language of training for specific businesses or professions, and Pre-Vocational English, which is concerned with finding a job and interview skills. (Dudley – Evans & St. John, 1998: 7)

### 2.1.4. General English and English for Specific Purposes

Here, I approach two types of English teaching – General and Specific. In both cases linguistic knowledge includes the correctness of grammatical structures, specific choice of words and exactness of their meaning.

General language teaching covers the teaching of the fundamentals of grammar, of expression as well as of pronunciation and provides a stronger or weaker basis for possible further language studies. In any case, the language teacher both at a secondary and at a higher school is in charge of the correct use of the language by its learners. Teaching

language for specific purposes is determined by different – professional/occupational, social and other – needs of the learner.

Therefore, English for Specific Purposes (ESP) includes specialized teaching curricula which are designed to develop the communicative use of English in a specialized field of science, work or technology. To be able to speak on a professional subject it is not enough to know general vocabulary. However, a great part of professional vocabulary consists of general words, which either have a shift of meaning or make a new unit, usually becoming a compound word or a combination of words. In the case of ESP, language teaching/learning is purposeful, i.e. predetermined by the *need* (see sector 2.2.) of the students not only to get familiarized with both the language of science and technology, and consequently, with the English language of the subject they study, but also with the subject itself. So, the language becomes a means of teaching technical content and appears to be significant in the context of the professional world. Nowadays students have access to the Internet, and the knowledge of English opens the doors to getting global information and the exchange of the information on the subjects they are interested in. Therefore, teaching/learning ESP is said to be skills-oriented as it is based on specific (professional) needs and the respective skills to be developed by the student. ESP concentrates not only on the recognition of particular structures of sentences or word combinations, but also on the choice of terms and meanings of words in different kinds of texts and contexts. Specific skills are required to read and produce texts which contain technical vocabulary and show the authentic purpose of the language in that field.

In order to provide an appropriate and thorough foundation in the use of English for professional purposes it is necessary to revise and further develop the student's command of General English, particularly, for many different everyday uses of English. In pointing out the difference between ESP and General English, Hutchinson and Waters (1987) believe that there is a great deal of difference in practice, but not in theory. As to the distinction between these two terms, they posit that,

> *…what distinguished ESP from general English is not the existence of a need as such but rather the awareness of the need. If learners, sponsors and teachers know why the learners need English, that awareness will have an influence on what will be acceptable as reasonable content in*

> *the language course and, on the positive side, what potential can be exploited. (Hutchinson & Waters, 1987: 53)*

They also believe that the fact that language is used for specific purposes does not imply that it is a special form of the language, different in kind from other forms. It comprises, however, some characteristic features that define a particular context of use and which, therefore, the learner is more likely to meet in the target situation.

## 2.2. Needs Analysis

The key defining feature of ESP is that its teaching and materials are, essentially, founded on the results of needs analysis (NA). The first questions when starting preparation for teaching an ESP course are almost always: What do students need to do with English? Which of the skills do they need to master and how well? Which genres do they need to master, either for comprehension or production purposes? Needs analysis leads to the specification of objectives for a course or set of courses, which in turn lead to the syllabus (es) and methodology.

Their needs are defined by a learning or occupational situation in which English plays a key role. Specific needs can be identified by examining that situation and the texts (written or spoken) in detail. The ESP teacher always needs to consider this specific subject knowledge, which leads to classroom interaction and teaching methodology that can be quite different from that of General English.

An initial needs analysis offers information about the target situation, that is what learners will have to do with the language and the skills and the communicative contexts that are needed. This is generally called *target situation analysis*. Information about the learners – in particular their language level, weaknesses in language and skills needed (often called lacks), and also their own perceptions of what they need (wants) – are essential guidelines in NA. The investigation of subjectively felt needs, as opposed to the objective needs established by target situation analysis, is called *learning situation analysis*. The investigation of learners' weaknesses or lacks is called *present situation analysis*. (Carter & Nunan, 2001: 133)

**Context, Communicative Needs and Needs Analysis**

In my study, NA was a key asset since it was the only way in which I could gain some perspective on how communication is carried out and which genres are used in these academic and professional contexts. Therefore, I needed to retrieve this information through questionnaires distributed among the different discourse communities (see section 2.3). With the questionnaires, I hope to have a clearer understanding of the respondents' communicative needs and the specificity of the language.

Within this ESP context, I viewed the term *needs* as comprising not only the English communication needs of the Electronics graduates at university but also their professors' perceptions of the students' needs and the industry's needs at large. In recognizing target needs identified by the students' and by their professors' in academia, and the engineers' in the workplace I looked into Hutchinson and Waters' (1987) definition of target needs in term of necessities, lacks and wants. To analyze the academic and workplace communication needs of the Electronics students, professors and engineers, I would have to study *necessities* determined by the demands of the students and the graduates currently working in their workplace, that is, what the students and engineers need to know in order to function effectively in the target situation. Hutchinson and Waters (1987: 55) state that identifying the necessities alone is not enough, as one needs to know the areas in which the students and engineers have lacks.

The development of the model for needs analysis is based on aspects forwarded by Hutchinson and Waters (1987:59) on the 'why', 'how', 'who', 'where' questions in their target situation analysis framework. Therefore, these questions were considered in the formulation of the questionnaires (see following chapter). The questions were aimed at identifying the academic and workplace 'language in use' in situations which are essential to the Electronics Engineering students, professors and engineers.

Needs Analysis is a fundamental tool in language teaching and learning because it leads to an appropriate choice of academic and professional genres, and therefore, teachers can establish working objectives more clearly. Throughout the following chapter, I will refer to NA and refer to this as a guideline to uncovering important data regarding the genres and

communicative contexts that these respondents should be familiar with for academic and professional reasons.

## 2.3. Genre Theory

Studies show that Genre theory has contributed immensely to the understanding of the way discourse is used in academic and professional contexts in the past few years. However, its development has been quite understandably controlled by the nature and desire of its applications, which have constantly focused on language teaching and learning, or communication training and consultation.

Genre analysis is the study of situated linguistic behaviour in academic or professional settings, and defined in terms of consistency of *communicative purposes*, as it is in John Swales (1990) and V.K. Bhatia (1993).

Ken Hyland (2004: 24) distinguishes three approaches to genre study:

1.The first approach is based on a Halliday's Systemic Functional view of language such as that applied in the Australian school system for L1 and SL writers, where genre is defined as a step – by - step, goal-oriented social process which involves the interaction of participants using a language in a conventional and organised structure; In addition, the "Sydney School" focused on the role of a systemic functional metalanguage and brought out the role of genre and register in the teacher's intervention and demands and possibilities of scientific literacy. (Johns, 2002: 17)

2. The second approach is in an ESP perspective such as that of Bhatia (1993) relating to law and business genres, or Connor & Mauranen (1999) in an academic context, where genre includes "a class of communicative events linked by shared communicative purposes recognized by members of a *discourse community"* (Swales, 1990: 45). These communicative purposes help to shape the ways that genres are structured and the choices of content and style it makes available. Swales (1990: 45-7) found that a discourse community:

- has a broadly agreed set of common public goals,
- has mechanisms of intercommunication among its members,
- uses its participatory mechanisms primarily to provide information and feedback,
- utilizes and hence possesses one or more genres in the communicative utterance of its aims,
- has acquired some specific lexis (specialized terminology, acronyms, etc.),
- has a threshold level of members with a suitable degree of relevant content and discoursal expertise.

3. The third approach lies within the "New Rhetoric" perspective such as that of Berkenkotter & Huckin (1995) or Bazerman (in Freedman & Medway, 1994: 79) where genres are "systems of complex literate activity constructed through typified actions" and are studied using ethnographic approaches.

From among these three approaches, only the second appears frequently in the literature of L2 pedagogy and then mainly in the ESP context, and consequently, I based my study on this approach.

Underlying all these very varied approaches is a common focus on the analysis of authentic products of social interaction (texts), considered in relation to the professional, cultural and social contexts in which they are discussed.

An important aspect of genre theory is that genres are identified on the basis of a shared set of communicative purposes with constraints on acceptable contributions in the use of lexico-grammatical and discoursal forms. I based my study on these communicative purposes and I will look in depth at these while analysing ESP for Telecommunications in the following chapter.

Although genres are typically associated with recurring rhetorical contexts, they are not static. As Berkenkotter and Huckin (1995: 6) pointed out,

> *(...) genres are inherently dynamic rhetorical structures that can be manipulated according to conditions of use, and that genre knowledge is therefore best conceptualized as a form of situated cognition embedded in disciplinary cultures.*

Genre essentially refers to language use in a conventionalized communicative setting in order to give expression to a specific set of communicative goals of a disciplinary or social institution. This gives rise to stable structural forms by imposing constraints on the use of lexico-grammatical as well as discoursal resources.

Bhatia considered that the main goals of genre analysis were the following (Bhatia, 1993: 157 - 160):

- to understand and account for the realities of the world of discourse;

- to understand "private intentions" within professional genres;

- to understand individual, organizational, professional and social identities

constructed through discursive practices within specific disciplinary cultures;

- to understand how professional boundaries are negotiated through discourse practices;

- to investigate language as action in socio-critical environments;

- to offer effective pedagogical solutions;

- to negotiate interactions between discourse practices and professional practices;

### 2.3.1. Different perspectives of Genre

Genre is a term for grouping texts together, representing how communicators typically use language to react to different communicative circumstances. They help to organize and classify texts and the situations in which they occur. According to this study, my understanding of genre is therefore grounded in the texts found in speaking, listening, writing and reading, and the sense these students and professionals have of who they are and who they are communicating with.

Genres reflect differences in external format and situations of use, and are defined on the basis of systematic non-linguistic criteria, as shown by the following scholars:

- external criteria: newspaper articles in newspapers, etc. (Biber, 1989: 6)

- communicative purpose or linguistic content and form (Swales 1990, Bhatia 1993, Berkenkotter & Huckin 1995)

John Swales emphasizes the fact that the readership, genre and task are linked by communicative purpose. According to John Swales (1990: 10), the communicative purpose of genres steers language activities of a specific discourse community, is the prototypical criterion for genre identity, and operates as the primary determinant of tasks.

Carolyn Miller (1984: 165) describes genres as a response to social situations that are, equally, part of a socially constructed reality. That is, genres are part of the social processes by which knowledge about reality and the words are made. Genres, in this view, both respond to and contribute to the constitution of social contexts, as well as the socialization of individuals.

Any use of language is motivated by a purpose, as ESP is, whether that purpose be a clear, practical one (such as the need to write a letter in order to apply for a job), or a less substantial, but equally important, interpersonal one (such as the need to chat online). While the communicative purpose of a genre may not be immediately obvious, its form always is often regarded by teachers as knowledge of the text structure. This aspect of genre knowledge refers to shared conventions of grammar, vocabulary, content, organization, and so on, which allows people to understand and write texts with ease and confidence. Certainly, there are features that emerge with some regularity in a genre, and readers expect to see these familiar features when approaching a text, generally noticing if there are variations or absences. In chapter III – Methodology, based on my findings and the data obtained, I will approach these familiar features in genres and communicative contexts. In the field of LSP there has been growing interest in the socio-cultural functions of disciplinary genres, e.g. legal and scientific communication.

### 2.3.2. Genre and Text Types

At a linguistic level, different texts within a genre can characterize different text types, while linguistically similar texts from different genres may represent a single text type (Biber, 1989:6). The study of texts as genres, "how texts are perceived, categorized and used by members of a community" (Swales 1990:42), was not analysed in Linguistics, until the Systemic School studied it.

The relationship of texts and contexts is central to this framework as interactions can only be understood by seeing them against the light of their social setting. Texts within particular genres can differ greatly in their linguistic characteristics (texts in magazine articles can range from narrative and colloquial to informational and highly structured). On the other hand, different genres can be similar linguistically (newspaper and magazine articles).

The term text refers to a complete linguistic interaction (spoken or written), preferably from beginning to end. The fact that by simply reading or listening to a text makes it easy to figure out so much about its source, clearly suggests that in some way context is in the text. The ability to deduce context from text is one way in which language and context are interrelated. Additionally, the ability to predict language from context provides further evidence of the language/context relationship, for example the language/context relationship in business letters.

In the ability to predict accurately what language will be appropriate in a specific context, the reader or writer of a text, in this case a student or engineer, has an intuitive understanding that language use is sensitive to context.

### 2.3.3. Genre in ESP

Researchers in English for Specific Purposes (ESP) are interested in genre as a tool for understanding and teaching skills required of non-native English speakers in academic and professional contexts. As I will demonstrate in Chapter III- Methodology, the ability to function competently in a range of written and spoken genres is often a central concern for university students and engineers as it can determine their access to career opportunities and life choices. As a result, ESP investigates the structures and meanings of texts and communicative situations, the claims placed by academic or professional contexts on communicative purposes.

ESP researchers' interest in the communicative needs of particular academic and professional groups leads them to what it is those groups are communicating. Here, in particular, genres are the social actions routinely used and recognized by engineering

students and engineers to achieve a particular purpose, written for a particular audience and employed in a particular context.

John Swales (1990) makes it clear that people acquire, use, and modify the language of communicative situations in the course of acting as members of occupational groups. These communicative situations and genres are rarely found in isolation in the real world. As a result, I decided to explore the relationships between genres in workplace and academic settings.

## 2.4. Register Analysis

In ESP, discourse variation in academic or professional contexts has been popularly analysed first in terms of registers, and then more recently as genres, but both of them take into account some aspects of structure variation. The communicative success of a text calls for appropriate combinations of genre and register. Registers have been variously identified, often on the basis of specific organization of three register variables (Eggins, 1994: 52): *field of discourse*, *mode of discourse*, and *tenor of discourse* (Halliday et al. 1964).

Register theory describes the impact of dimensions of the immediate *context of situation* of a language event on the way language is used. The concept of genre is used to describe the impact of the *context of culture* on language, by exploring the staged, step-by-step structure that cultures institutionalize as ways of achieving goals.

Three key dimensions of the situations are identified as having significant and predictable impacts on language use. These three dimensions, the register variables of *mode* (the immediacy with which feedback goes back and forth in the interaction and the role language is playing in mediating communication), *tenor* (role relations of power and solidarity) and *field* (topic or focus of the activity) are used to clarify that these students and engineers will not use language in the same way to write as to speak (*mode variation*) and to talk about the weather as to talk about electronics (*field variation*). (Eggins, 1994: 9)

Meaning in text is essential to analyse because it expresses a communicator's role relationship with another communicator, as well as a communicator's attitude towards the subject matter. Additionally, while expressing both experiential and interpersonal meaning, a text also holds a textual meaning. This refers to the way the text is organized as a piece of writing or speech.

Experiential meanings are meanings about how I, as a reader and a writer, represent experience in language. Whatever use I put language to, I am always talking about something or someone doing something. Simultaneously, I am using language to make interpersonal meanings: meanings about role relationships with other people and the attitudes to each other. Therefore, I am always expressing thoughts, feelings, and role-playing. Finally, in any linguistic event I am always making textual meanings: meanings about how or what to relate to in what was said before and to the context around me, i.e. the way I organize my information.

### 2.4.1. Register Variables

A genre can only be accounted for through a specification of field, tenor and mode, and a description of the linguistic features realized in the experiential, interpersonal and textual components of particular texts (Eggins, 1994). Registers are divided into genres, reflecting the way social purposes are accomplished in and through them in the settings in which they are used.

First, the subject – the matter of the text is the field of the text. With the help of lexical items, it is easy to identify the field of the text.

Second, the role language is playing in the text refers to the mode of the text. This helps to identify the role language is playing in the interaction and the distance between the communicators. With lexis and conversational particularities, a person can quickly distinguish a telephone conversation, where the two communicators are not speaking face to face.

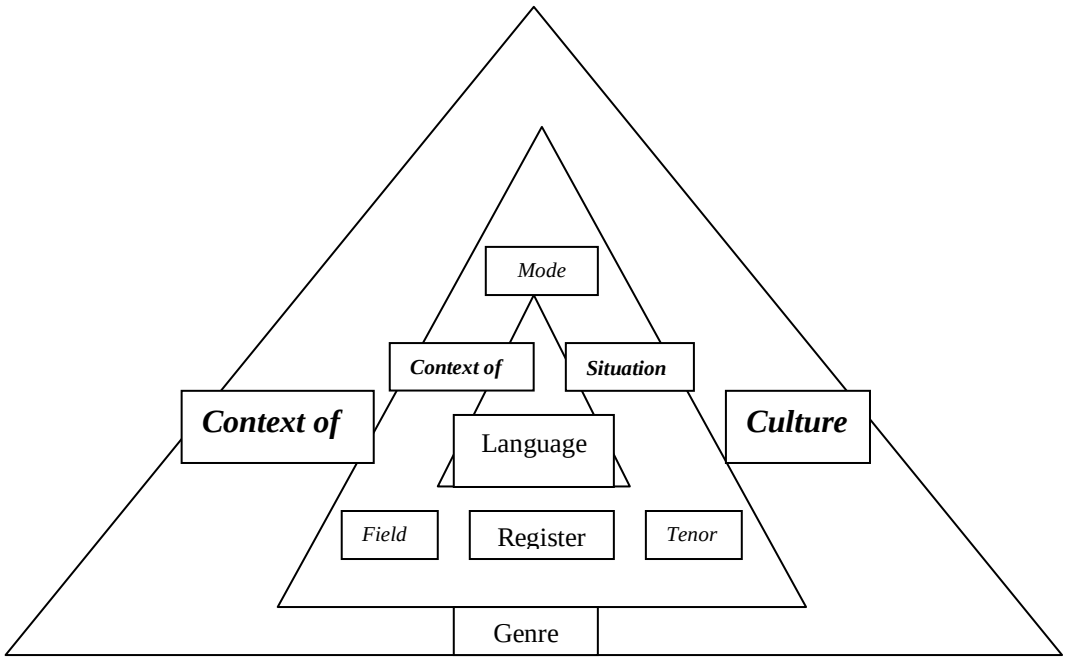
Third, the interpersonal relationships between communicators are evinced in the tenor of the text. Tools in the language use that indicate tenor include the use of politeness

expressions, which students often use when interacting with university professors, for example.

Register describes the immediate situational context in which the text was produced. A communicator, be it a student, engineer, or university professor, is forced to recognize, firstly, that linguistic behaviour is goal-oriented, i.e. there is always a purpose in conversation or in a text; and, secondly, that linguistic behaviour takes place within both a situation and a culture. Obviously, an ESP teacher needs to understand how the students use the language in order to teach them effectively, and as a result, the teacher needs to consider both the context of situation and the context of culture.

The relations between genre, register and language discussed above are represented in figure two:

**Figure 2 - Genre and Register in relation to language**




Source: Eggins, 1994: 34

As shown in figure number two, genre is one of two levels of context: context of culture (genre), which is more abstract, more general than the context of situation (register). Genres are determined through language, i.e. this process of realizing genres in language is mediated through the realization of register. Register holds back a certain anarchy in the

act of creating language and communicating, as it structures and regulates the act of communication.

These three elements have consequences for the language choices readers and writers make, so that some registers, such as those in legal or scientific fields, for example, are likely to contain texts with fairly predictable features of lexis and grammar, while more personal and informal registers tend to be more open, with texts containing a less limited series of meanings and forms. Register variables basically demonstrate that communicators do not use language in the same ways to write or speak, to talk to their boss or talk to their friends, to talk about fashion or to talk about electronics. The second level of text-context interaction is genre, where linguistic choices are influenced by the engineer's professional/social purpose in using language, what he or she sets out to do.

Students, as future engineers, university professors and engineers need to be aware of the realisation of register in the understanding and production of different genres mentioned later in this study.

As Malinowski pointed out (1946: 307),

> *The meaning of any single word is to a very high degree dependant on its context. (...) In order either to serve purposes of common action, or to establish ties of purely social communion, or else to deliver the speaker of feeling violent feelings or passions…utterance and situation are bound up inextricably with each other and the context of situation is indispensable for the understanding of the words…*

These three variables are called the register variables, and a description of the values for each of them at a given time of language use is a register description of a text. With these three variables, Halliday wanted to show that they have a direct and significant impact on the type of language that will be produced. Hence, the relevance of this study linked to the analysis of results obtained from the students', engineers' and professors' questionnaires described in the following chapter. I will now define each one of the register variables independently and link them to the language use discussed in chapter III.

*Field*

Field is the variable of situation that has to do with the focal point of the activity in which the communicators are engaged. The situations may be either technical or everyday in their construction of an activity focus.

A technical situation would be characterized by a significant degree of assumed knowledge among the communicators about the context, whereas in an everyday (or commonsense) situation, the only assumed knowledge is 'common knowledge'. The knowledge that constitutes a field can be represented in taxonomies (Eggins, 1994: 72), by asking, "how do people who act in this field classify or sub- classify the areas of the field?". When creating field taxonomies, there is a prominent difference between the depth and complexity of a technical taxonomy and that of a commonsense taxonomy.

In a technical situation, there is a heavy use of technical terms or 'jargon': not just technical nouns (e.g. bandwidth, nodes, and carrier) and technical acronyms (e.g. GSM - Global System for Mobile Communications).

Language in an everyday field is a more familiar form of communication: the lexis tends to consist of everyday words. In this context, technical terms are usually signalled as such by being printed in bold or having quotation marks around it (e.g. 'node'). The two fields studied in this study are the technical and academic fields.

*Mode*

In terms of mode, that is the medium used to communicate among the different communicators, Martin (in Christie, 1984: 21-9) has suggested that this role can be seen as involving two simultaneous continua which describe two different types of distance in the relation between language and the situation.

1. Spatial/ Interpersonal distance – at one extremity of the continuum, there is both visual and aural contact, and therefore feedback is immediate, such as in a meeting or oral presentation; at the other end of the continuum would be the situation of writing a letter or report, where there is no visual or aural contact between writer and readers, and therefore no possibility of immediate feedback (Eggins, 1994: 52).

In the middle of these two extremities, there are other types of situations, such as telephone calls (where there is aural but not visual contact, with slight contact, but with the possibility of delayed or no immediate feedback). Modern communication modes (such as faxes, telexes, and electronic mail, etc.) reveal complicated mode dimensions, in terms of immediate contact and feedback.

2. Experiential distance –the second continuum of experiential distance ranges from situations according to the distance between language and the social process occurring. At one extremity of this continuum, there are simultaneous situations such as telephoning or negotiating, where language is being used to accompany the activity communicators are involved in. Here, the language used is just one of the means being used to achieve an action in progress. This contrasts with the other extreme, for example writing a note, where language is all that there is. There is no other social process and the language is being used to reflect on an experience, instead of experiencing it. (Martin in Christie, 1984: 27)

These two dimensions of mode characterize the basic contrast between spoken and written situations of language use. As I will analyse in the following chapter, spoken language is typically used in interactive situations. Spoken situations are determined by immediate face-to-face contact between communicators, with spontaneous and unrehearsed actions. On the other hand, written communication is a 'solitary' action, where the communicators are not in face – to – face, aural or visual contact with the intended audience.

Further linguistic differences are described in chapter III: a range of spontaneity phenomena such as hesitations, false starts, repetitions, interruptions, etc., whereas the written text, especially technical texts, will not contain these features. In addition, there are two more linguistic features that lead to mode variation: the degree of grammatical complexity, and the lexical density of the language chosen.

I found that the differences between the language of spoken and written situations are the functional result of the situational differences in mode. I will look into these differences in the next chapter, when I study the following genres in an academic and professional context.

**Table 1 - Written and Spoken Genres in a *Mode* Context as applicable to this study on English for Telecommunications**

| Written Genres | Spoken/Aural Genres |
|---|---|
| a) Correspondence (formal and informal letters, e-mails, etc.)<br>b) Instruction manuals.<br>c) Machine warnings.<br>d) Scientific Bibliography (books, articles, catalogues, magazines, etc.)<br>e) Protocols.<br>f) Software manuals.<br>g) Internet sites.<br>h) Informative pamphlets.<br>i) Questionnaires and forms.<br>k) Reports.<br>l) Essays. | a) Telephone conversation.<br>b) Socialising.<br>c) Oral Presentations: lectures, conferences, classes, debates etc.<br>d) Meetings.<br>e) Negotiating (Buying and Selling). |

*Tenor*

Instinctively, a communicator knows that the kind of social role they are playing in a situation will have an effect on how they use language. For example, a student does not speak to a university professor in the same manner that they speak with a family member. The tenor variable is built on the studies of language variation and role relationship variables such as formality, politeness and reciprocity. Tenor can be divided into three different dimensions: power, contact, and affective involvement (Eggins, 1994: 64).

Power - this dimension schematizes roles based on equal and unequal power. Examples of roles of equal power are those of friends; examples of roles of unequal (non-reciprocal) power would be those of a boss and an employee.

Contact – this dimension refers to frequent or infrequent situations associated to roles that communicators are playing. For example, contrast the frequent contact between a married couple, with the occasional contact among business partners.

Affective involvement – here, affective involvement between the communicators is estimated between high and low. This dimension refers to the extent to which the communicators are emotionally involved or committed in a situation. For example, friends or lovers are affectively involved, whereas students and professors are typically not. (Eggins, 1994: 64)

These aspects of our role occupation in a given situation will have an impact on how the communicators use language. Following this approach, I will analyse two contrasting situation types, the informal and the formal, according to their typical tenor dimensions. An informal situation is defined by equal power relations, who contact each other frequently, and are affectively involved. A formal situation is one where the power between the communicators is unequal, the contact is occasional, and the affective involvement is low.

As I mentioned the mode and tenor dimensions establish that language use will vary significantly in relation to different situations: in this case, formal and informal situations. In terms of vocabulary, informal language use tends to use words that express the communicator's feelings. In a formal situation, on the other hand, the communicator is more reserved in terms of feelings, or tries to express these in apparently objective language. Lexis will also differ in terms of its degree of standardisation: in informal situations, the use of slang and abbreviated forms of words is frequent; in formal situations, the use of complete lexical items, with the exception of technical acronyms, and avoidance of abbreviations is frequent.

These three elements have consequences for the language choices readers and writers make so that some register, such as those in legal or scientific fields, for example, are likely to contain texts with fairly predictable and conventional features of lexis and grammar, while more personal and informal registers tend to be more open, with texts containing a less limited series of meanings and forms.

Finally, as I have mentioned, these register variables demonstrate that language use is not the same in written and spoken contexts: to talk to our boss or talk to our friends, to write an informal letter or a formal one. The second level of text-context interaction is genre, where linguistic choices are influenced by the student's or engineer's professional/social purpose in using language, what they set out to do. An engineer, for example, who is given the task of writing a report on wireless communication, has many of these choices made for him or her at the outset. He or she knows that it will be in writing (mode), that the readership will be other engineers or company administrators, that certain relations of power and solidarity will come into play (tenor), and that the topic or focus of this task will draw on certain vocabulary and subject matter (field). Nevertheless, before taking these steps, the engineers have to outline the structure of the report to best achieve their goals - whether to report a particular situation, to explain the reasons for it, to argue for certain solutions, etc. As a result, while the notion of register refers to broad fields of activity that often have common characteristics, genre is a more concrete expression of field, tenor, and mode, involving conventions for organizing messages so readers and listeners can recognise the purposes.

As I have made specific analysis of the genres and discourse situations engaged in by engineers and students, I address the following individual textual genres in chapter III and describe their use in depth.

### 2.4.2. Academic and Professional Genres and Communicative Contexts

As my main goal is to study language use in context such as the contexts associated with specialized registers (e.g. professional or academic), I decided to look into the following contextual dimensions of language. In order to do this, I have chosen to distinguish between two types of contexts: Academic and Professional genres and Communicative Contexts.

## Table 2 - Academic Genres and Communicative Contexts as applicable to this study

| |
|---|
| a) Correspondence (formal and informal letters, e-mails). |
| b) Instruction manuals. |
| c) Machine warnings. |
| d) Scientific Bibliography (books, articles, catalogues, magazines, etc.) |
| e) Protocols. |
| f) Software manuals. |
| g) Internet sites. |
| h) Informative pamphlets. |
| i) Questionnaires and forms. |
| j) Telephone conversation. |
| k) Participating in meetings and/or (video) conferences. |
| l) Socialising. |
| m) Participating in classes, lectures and debates. |
| n) Oral Presentations. |

**Academic Genres**

In the academic setting of electronics, I believe that the academic community, in particular, greatly influences the linguistic behaviour of its members, and consequently the communicative organization. The group membership manifests itself on the basis of social and communicative content, i.e. with reference to knowledge, norms, attitudes and values in general and to language and texts in particular.

At an academic level, communication takes place regularly by means of written messages, notices of meetings and memoranda, as well as by oral communication. The academic community communicates with other academic communities inside the country or internationally, with the industrial/corporate sector, the country's local government or the scientific community. In such environments, communication takes place mainly in a

written form with correspondence (memoranda, formal and informal letters, e-mails, etc.), scientific bibliography, etc. as the prototypical means of communication. In the eighties and nineties, the development of the genre approach to the teaching of academic writing began as an attempt to help students deal with the needs and demands of writing in academic settings and to give them access to genres of power in the academy (Swales & Hyon, 1994). Nevertheless, oral communication also occurs, often on the telephone, but also in direct or indirect meetings at conferences, conventions, etc. Contacts with society also occur mainly in a written form, although oral contacts can obviously also be maintained indirectly by means of the telephone, press meetings, radio and television.

**Professional Genres and Communicative Contexts**

In a professional environment, communication and contact occur both in writing and orally. These contacts relate to other companies (small, medium, or multinational), groups of companies, an entire sector (e.g. engineering sector), the government, or the scientific community. In such settings, communication takes place chiefly in a written form with correspondence (memoranda, formal and informal letters, e-mails, etc.), scientific bibliography, company notices, manuals, etc. On the other hand, oral communication often takes place on the telephone but also in connection with direct or indirect meetings at conferences, conventions, etc.

An understanding of genres in communication (written and spoken) is essential to professional success. In a professional environment, communication and contact occur both in writing and orally. These contacts relate to other companies, groups of companies, an entire sector (e.g. engineering sector), the government, or the scientific community. In such settings, communication takes place chiefly in a written form with correspondence, scientific bibliography, company notices, manuals, etc. On the other hand, oral communication often takes place on the telephone but also in connection with direct or indirect meetings at conferences, conventions, etc. Essentially, the great differences between the academic and professional discourse communities are the settings and the register of the genres and contexts. The following table offers various examples of professional genres and contexts.

## Table 3 - Professional Genres and Communicative Contexts

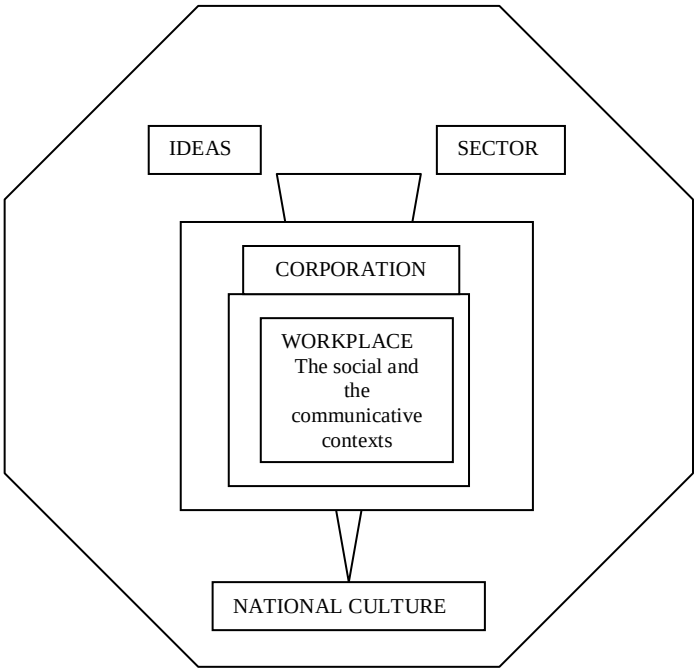
| |
|---|
| a) Correspondence (formal and informal letters, e-mails, etc.). |
| b) Instruction manuals. |
| c) Machine warnings. |
| d) Catalogues. |
| e) Scientific Bibliography (books, articles, catalogues, magazines, etc.) |
| f) Software manuals. |
| g) Protocols. |
| h) Internet sites. |
| i) Work Agenda. |
| j) Contracts. |
| k) Notices or/and Circular letters. |
| l) Labels. |
| m) Agendas. |
| n) Suppliers proposals. |
| o) Telephone conversation. |
| p) Participating in meetings and/or (video) conferences. |
| q) Participating in trade fairs and conferences |
| r) Solving technical problems with other workers inside and outside the company. |
| s) Vocational training. |
| t) Solving interpersonal problems. |
| u) Interviewing. |
| v) Socialising. |
| w) Negotiating. |
| x) Oral Presentations. |

As I mentioned in the introduction, the changes in this corporate and globalised world, have placed increased demands on the skill levels of professional communication. From a socio-linguistic point of view, the relationship between texts and corporation is a two-way one. Creating texts is a part, and an important part, of a corporation's work. Texts are

influenced by the social context, therefore reflecting the company and its social structure, values, knowledge and culture.

Looking at the authentic corporate discourse, however, the most prominent feature is its complex and multi-dimensional environment. A company functions within various social structures with different cultures. The various sociolinguistic dimensions of corporate discourse have common characteristics and links leading to a complex and multifaceted structure of discourse, as the following figure illustrates:

**Figure 3 - The Multilayered Structure of Corporate Discourse**




Source: Gunnarson in Trosberg & Jørgenson, 2005: 106

In this chapter, I have given a brief overview of ESP and its evolution through time, as well as its relevance through genre theory as an approach to language teaching and the learning process. By exploring ESP and Genre Theory in the area of Electronics Engineering and Telecommunications, I had the objective of providing answers to linguistic demands of the academic and professional world made on students and engineers. After looking into the different genres that I needed to explore, I found that it was important to define the concepts of register and the variables (field, tenor and mode)

academic and professional genres and contexts. Overall, this chapter discusses the reasons for choosing Genre Theory and Register Analysis as the theoretical perspectives to support this study.

In the following chapter, I present the applicability of this theoretical framework through the usage of questionnaires applied to students of the Electronic Engineering and Telecommunications course at the University of Aveiro, engineers working in the area of Telecommunications throughout the country and professors.

# Chapter III – Methodology

"The essential is invisible to the eyes – repeated the little prince in order to remember."

*The Little Prince* - Antoine de Saint Exupéry

In this chapter, I will present the findings and discuss their importance in the development of my work. As I mentioned in the previous chapter, assessing needs may be done by means of questionnaires or interviews in order to be able to identify the specific linguistic needs of the learners in academic and professional settings. The main goal was to establish a link between the genres produced by the discourse community and the learners' needs. In this chapter, I will be presenting the findings and discussing their importance in the study of ESP for Telecommunications. Considering the learners' needs in order to identify the materials and contexts in a learning environment is vital for teachers to adapt their tools to the learners' specific learning expectations and wants.

## 3.1. Research Design

### 3.1.1. Subjects

The subjects of this study are 39 students from the course of Electronics Engineering and Telecommunications at the University of Aveiro, eight professors of the same course and 21 engineers who work in nine Telecommunications companies. I chose these three groups of subjects in order to gather three different viewpoints on the study of ESP for Telecommunications. I also interviewed the director of the course, Electronics Engineering and Telecommunications, Professor Doutor Armando José Formoso de Pinho.

Before I started my research, I thought about the objectives of this project and its main potential readership. Therefore, I concluded that I did not only want to help ESP teachers in their endeavours to better the English materials and teaching strategies, but also help engineers and university students in their professional and academic lives respectively. I thought that the best way to conduct this investigation was to ask the three sources directly. In other words, I also turned to them for help in answering some fundamental questions and identifying specific situations. In this way, I hoped that the relationship between the three communities and this project would be of a two-way interest. I imagined that the university students would be vital to the research in order to help identify the needs for ESP in an academic context and in a pre-working environment. On the other hand, the professors would also be crucial, to identify the contexts in which students need ESP in their daily academic routines. The engineers would have a central role as mediators between the academic setting and the job market, as they know both worlds best. They would not only identify the lacks and needs of ESP in their own world, but also attest to the lacks that a university student experiences.

### 3.1.2. Instruments

As I mentioned in section 3.1.1., I chose to interview the director of the course, Electronics Engineering and Telecommunications, Professor Doutor Armando José Formoso de Pinho, in order to identify the students' needs in General English and English for Specific Purposes in this area, and clarify some misunderstandings that might occur in the questionnaires. An interview can provide depth of explanation within a particular context, like this one, while questionnaires can paint a broader though possibly more superficial picture. (Drever, 1995: 1)

Another instrument used for this study is a set of questionnaires designed to identify the gap between the students' and workers' needs in relation to the workplace and the community, and gather information about:

-the English communicative needs of students and engineers;

-communicative skills needed in the workplace: *reading*, *writing*, *speaking*, and *listening*;

- the different *genres* used in an academic setting and the workplace;

I decided to use questionnaires because they are a productive way of gathering information and I could collect information from quite a large number of people very quickly.

The questionnaires and the interview were designed as the instruments for data collection. The questionnaires were structured for the purpose of gaining further insights into the situation of ESP for Telecommunications. The second stage of my research was to identify the subjects of my research and potential respondents. Letters were sent to the director of the course, to several professors teaching on the course and to every Telecommunications company in the country in order to ask for their permission to conduct the research. After receiving the replies, I had a total of thirty-nine responses from students, eight from professors, and twenty-one from company workers.

### 3.1.3. Interview Design

As was previously mentioned, this project required an in-depth understanding of ESP needs in the area of Electronic Engineering and Telecommunications, and keeping this in mind, I decided to adopt the semi-structured interview as propounded in Drever[2]. I set up a general structure by deciding in advance what matters to cover and what main questions to ask (Drever: 1995:1). The detailed structure had to be worked out during the interview. The person interviewed could answer at some length in his own words, and I used prompts, probes and follow-up questions to get the interviewee to clarify or expand on his answers.

For the needs assessment in this study, I decided to interview the director of the course, Electronics Engineering and Telecommunications, *Professor Doutor* Armando José Formoso de Pinho and ask the following questions (see appendix I for Portuguese version):

- What is your degree in?
- How many years do you have of English language learning?
- How often do you use English at work?
- In which contexts do you use English?
- What language skill do you use the most?

[2] Drever, E. (1995). Using Semi-Structured Interviews in Small-Scale Research. Glasgow: The Scottish Council for Research in Education.

- Are you aware of your students' English level? If you are, are you satisfied with their level of English?

- Do you think English for Specific Purpose for Telecommunications is important for the education of future Electronics engineers? Why/ Why not?

- Do you believe that the English language widely contributes to the development of technology and innovation? Why/ Why not?

- Would you like to add any further information about the importance of English language use for the students of the course - Electronics Engineering and Telecommunications?

In this interview, I gathered factual information about his responsibilities and attributes as the director of the course and as an Electronics Engineering and Telecommunications major at the University of Aveiro. Additionally, I collected statements of his preferences and opinions on ESP, on using English terminology and the level of English of his students and explored in some depth his experiences, motivations and reasoning on the same subjects. (question methodology from Drever, 1995)

The main questions led the interviewee through my chosen topic. They formed a logical sequence, so that the interview 'flowed' naturally. As a rule I placed the more general questions first. I avoided any sequence where the discussion on the first question was likely to influence later answers.

As the Director of the Electronics Engineering and Telecommunications at the University of Aveiro, I believed that his opinion and suggestions relating to the use and need of English for Specific Purposes in this area would be crucial for my study. I began to look into his academic profile by asking him about his education, training and work experience, and his level of English, and consequently identify the target situational analysis. The first three questions were posed to have a better understanding of this professor's objective needs in terms of General English and English for Specific Purposes. The questions related to the communicative contexts and skills used in his working environment were asked with the intention of comparing these answers with the results of the students' questionnaires. In this way I could perceive the director's awareness of his students' needs in order to

conclude about the type of language awareness and education that the head of an engineering course has. Consequently, the following questions had this same objective – recognize the present situation analysis - "Are you aware of your students' English level? If you are, are you satisfied with their level of English?". It is essential in developing any course to have an appropriate and pertinent curriculum. The English language was deemed secondary or optional with regard to students' needs, could this affect them in reaching success during their academic years and in their professional future?

I decided to ask about the importance of ESP in Telecommunications before the question related to the importance of English in innovation and technology, because I did not want to influence the director's answers. I wished to convey the director's opinion on ESP for Telecommunications first in order to study the two opinions objectively. Since it is obvious that innovation, technology and English are interconnected, I believed that this fact would influence the director's opinion of ESP for Telecommunications. In this way I did not obtain two similar answers to the questions, but two very different answers that I will analyse further on in this study. The last question was posed to give the director a chance to offer suggestions on this topic and, therefore, bring new light to this study.

### 3.1.4. Questionnaire Design

The intention of the three sets of questionnaires was to deepen my research and gather as much information as possible about the language needs in ESP for Telecommunications. This task was not easy because, although the main objectives were the same, the subjects were not. I knew I had to pinpoint different needs according to the different communities and so I realized that each question had a very specific purpose for my research.

In order to obtain the information required I realized that:

1. Questions had to be phrased in a way that matched the vocabulary of my respondents.

2. Questions had to be clear and unambiguous.

3. Categories of response also had to be clear. It is important that the difference among categories of response is obvious to the respondent.

4. I had to be clear about the factual basis behind opinions. Opinion questions are difficult because there are usually many aspects to an opinion.

5. I had to be careful with wording. (Munn, 1999: 22- 25)

To have an approximate idea of the actual situation of English for Specific Purposes in Electronics Engineering and Telecommunications, I elaborated the three sets of questionnaires and distributed them among professors, second and fifth year students and workers in this area; I will describe each set individually in this chapter. The questionnaires distributed among the students and workers were similar in structure and content. The students' questionnaire has 11 questions and the engineers' questionnaire has 12 questions organised into three sections, apart from: - Heading (name (optional), age, company name, etc.):

A. Profile

B. English language use in specific contexts

C. General Considerations

The professors' questionnaire has five questions that make up the General Considerations sections, apart from the profile of each respondent: name (optional), age, subject taught, and number of years of professional experience.

In order to obtain this different information, I found that using three different types of questions, according to the different contexts, would make it easier for me to analyse each answer or point of view. The questionnaire consisted of:

- Open Questions, which as the name suggests, leaves respondents free to answer the question in the most appropriate way. These questions were accompanied with yes/no categories and then a justification of the answer given, for example, "Do you think English for Specific Purposes for Telecommunications can improve the work of Electronics engineers?".

- Closed questions that offer categories of response and respondents cannot answer as freely as the above mentioned question type. However, in a closed response, I found it useful to include the category 'others' so that the respondents could offer their personal view. I used closed questions in section B, when I intended to gather more information about the language skills and *genres* used in the professional and academic settings.

- Scaled responses are the most obvious way of collecting opinions. There are various ways of scaling, but I decided to take the idea of 'importance' and 'satisfaction', and provided intervals from 'very important' to 'not important at all', for example.

Once I obtained my responses, and later gathered and analysed the information, I could speak with some clarity about the views and circumstances of the respondents. However, there is considerable uncertainty about how far this applied to the community as a whole as I am aware of my sample's limitations and will exercise caution in generalizing about the whole community.

**Students' Questionnaires**

*A. Profile*

The first of the three sections of the questionnaires referred to the profile of the respondent and to the use of ESP within academia. I looked into the students' academic profile from pre-school up to university level in order to pinpoint the English level – target situational analysis, and eventually the subjective and objective needs, of the second and fifth year students and later use these results as a point of comparison in the analysis of results obtained. The name and course curriculum were also vital because they are structured differently in other universities and this may be fundamental later in my study when looking at the communicative needs and lacks of each student or when designing an ESP course. Additionally, this section of the questionnaire would help me reinforce the hypothesis of a demand for a more frequent presence of a foreign language when students are studying, especially at university level.

*B. English language use in specific contexts*

The following section related to the present situational analysis, i.e. the use students make of the four language skills – speaking, listening, writing and reading - within their learning environment and it had the objective of obtaining more details about the real application of ESP for Electronics Engineering and Telecommunications. I sought to find the greatest number of communication genres to offer a wide variety of options that are similar to those occurring at university. This is especially patent in the last question of this sector, "According to the scale, order each of the following English language skills in terms of what an Electronics Engineer should be able to achieve in English.", where I mentioned different communicative contexts used by students in association with the genres enumerated in the previous questions of this sector. By offering a variety of options, I believe it made it easier for the respondents to answer and for me to predict their learning needs and lacks when they carry out their daily activities. Undoubtedly, I depended on my respondents to contribute with suggestions in order to fill in any lacks in this research. I decided to add question number one, referring to their learning needs in a specific subject, to the students' questionnaire because this would help me make out and confirm their needs in the subjects studied at university. By researching the library catalogue at the University of Aveiro and technical websites, I confirmed that a great number of the bibliography required is in English or Brazilian Portuguese. As I will discuss further on, reading is the skill most used by students, precisely because of the research that they have to carry out in academic subjects and for their end–of-course project.

*C. General Considerations*

In the third section of these two sets of questionnaires, I began with an open question related to the importance of ESP in the education of Electronics Engineers in the area of Telecommunications for the students' success. I believe that this is the most crucial question of my study, as it was the first question I posed when I thought of working on this subject. The answers are essential to reinforce the thesis that English for Specific Purposes should be given the significance it deserves, especially when taking into account that these students and engineers are integrated in the European Union and the globalised job market where competence in the English language, especially in the domain of technology, is considered a mandatory requirement. I decided to ask the students to evaluate their

knowledge of English (present situational analysis) so I could compare their level of English with the previous answers given throughout the questionnaire, that is, the options chosen in section B of the questionnaire and the opinions about the importance of ESP in their academic lives. I expected that these results would help me prove that, although students need ESP in their academic work, they do not usually need to apply the language to meet their more specific academic needs, while the engineers have the experience of being held back in their professional careers due to their less satisfying level of English.

As far as the question dealing with learning English in the future was concerned, I expected students to suggest some effective methods to acquire a higher level of linguistic, cultural and communicative competence. Additionally, it made it easier for me to identify aspects that students consider essential when learning a foreign language.

**Engineers' Questionnaires**

*A. Profile*

The profile was based on the personal and professional context of the working engineers: name (optional), age, course, company name, the main sector of the company, the number of workers, and the engineers' work position in the company. These questions led me to predict the level of objective and subjective needs of each worker inside the company. Here, I quickly distinguished what to expect in the analysis of the results obtained and what to look for in terms of company language policies.

Question number two, for example, dealt with the number of workers in the company in order to establish the companies' features. The statistical definitions of Small and Medium-sized Enterprises (SME) use one or more of three defining measurements:

- number of employees;
- turnover;
- size of the balance sheet.

Based on the definition of The European Commission of an SME in 2003, I added the options to question two of the questionnaire:

**Table 4 - Revised European SME definition**

| Enterprise category | Headcount | Turnover (€) |
|---|---|---|
| Micro | <10 | <2 million |
| Small | <50 | <10 million |
| Medium-sized | <250 | <50 million |

Source: *ec.europa.**eu**/enterprise/enterprise_policy/**sme**_definition/index_en.htm*

ESP research and teaching is focused on and sensitive to the learners' background and the effects of the environment in which they use English. Therefore, it was important to gather information about the age of engineers because I had to confirm that each of them had had at least three years of English in their school/academic profile. Additionally, I also had to verify if their schooling had occurred after the 25$^{th}$ April revolution in Portugal, when English-teaching policies changed drastically. Henceforth, students had to have at least three years of formal English schooling up to their University entrance year.

Moreover, I looked into each job position because each area has its own specific learner's need, for example, an Information Systems **N**egotiator needs presentation skills and negotiation skills in English, while an International Support Assistant will have to work on his/her reading and understanding skills because they are essential for the tutorials, manuals or protocols he/she has to work with. Clearly, the number of workers and the main sector of the company informed me of the size of the company and the role it has in the Portuguese and international economic markets.

*B. English language use in specific contexts*

The second section in the questionnaire dealt with the main aim of my study which was the finding of communicative *needs, lacks,* and *wants* of the working engineers.

Tony Dudley-Evans and Maggie St. John (1998: 95) once stated that,

> *(...) the teaching process of any kind of language for occupational purposes should take as a starting point the analysis of the four traditional skills within an appropriate context, that being, as far as possible, the conditions given in the workplace.*

This, I reiterate, was one of my main objectives, so I needed to gather information on how the respondents perceived and used the four traditional skills within the specific communicative contexts.

The questionnaire contained eleven questions related to the use of English within the work place and analysed the use of the four skills, communicative contexts and genres, among other situations. The interest of including questions relating to the use of the four skills was to test the degree of confidence in using English and the four skills in the workplace as was previously mentioned.

The different array of genres and communicative contexts displayed in questions specifically referring to the four language skills were brought together through my teaching experience, informal conversations with (former) students and working engineers, and additionally, through research of technical bibliography and ESP didactic material.

*C. General Considerations*

The first question in this section, similar to the students' and professors' questionnaires, is, "Do you think English for Specific Purposes in Telecommunications is important for Electronics engineers' academic profile?". As this question is the basis of my study, this question appears in the interview and every set of questionnaires because it is in this question that I will find the reason for the development of this study. It is the first question of this section because I did not want to influence the answers with other lead-in questions.

The following questions in the General Considerations section are related to the objective needs of the engineers in a professional context. I decided to ask the respondents questions with regard to the significance of English in the recruitment and evaluation of engineers, and determining the importance of language in the global corporate market. This question was also essential for my study in the way that it was a point of comparison between the students' perspective of their future careers and engineers' current reality.

When I decided to ask the following question, in which I asked students and engineers to evaluate their knowledge of English, I wanted to compare their level of English to the rest of the answers given throughout the questionnaire, that is, options chosen in the second section of the questionnaire and the opinions about the importance of ESP in their academic and working lives.

**Professors' Questionnaires**

The professors' questionnaire had a different structure from the students' and engineers' questionnaires, since I expected different information from these respondents. As I did not expect a large number of respondents, and did not need as much information from the professors as from students and engineers, I made up a questionnaire with five questions – two multiple-choice questions, two open questions and a scaled question.

The first three questions posed related to the importance of ESP in Electronics Engineering students' education and future perspectives. These questions allowed me to contrast ideas with the other two sets of questionnaires and, consequently, the analysis of these results came at the end of this study. Moreover, these questions also made it possible to expose the professors' awareness of their students' needs in terms of (language) tools used to improve their academic and, ultimately, their professional performance.

I also found that it was important to identify the professors' language awareness and their perceptions of their students' learning needs in order to contrast them with those of the students. The last question takes into account how confidently they usually face the given communicative contexts in English. I used these results to demonstrate that if professors did not communicate as confidently as they desired, students and engineers would also have these lacks. Although students might have a broader education in second language

learning, the lacks are considered similar because they appear at a tertiary level, where there are many deficiencies that cannot be solved until some improvements are introduced within the academic system.

## 3.2. Discussion of the findings

Based on the findings in the questionnaires, I began my study of the importance of ESP for Telecommunications. I went through three main stages in analysing the questionnaires: data preparation, data description, and interpretation of data.

### Analysis of the interview data

The director of the course, Electronics Engineering and Telecommunications, Professor Armando José Formoso de Pinho, was interviewed in the department at the University of Aveiro. The interview was not recorded, therefore there is no transcript. Before carrying out the interview, I introduced my study by briefly explaining the objectives and the proposed content of this dissertation. After this short introduction, the director provided some information about his academic profile and his linguistic profile. He is an Electronics and Telecommunications major from the University of Aveiro. He also has a Masters degree in Electrical and Computers Engineering from *Instituto Superior Técnico*, Technical University of Lisbon, and a PhD. in Electrical Engineering from the University of Aveiro. He is currently an Associate Professor at the department of Electronics, Telecommunications, and Informatics of the University of Aveiro, and a researcher at the Signal Processing Laboratory of the Institute of Electronics and Telematics Engineering of Aveiro (IEETA).

Linguistically, the director highlighted that he is satisfied with his level of English. He also stated that he uses the language on a daily basis in terms of scientific bibliography, correspondence (e-mail) and documentation and, so, reading and, mostly writing were the skills he used the most. Although he admitted that he did not know the level of English of the Engineering students at the University of Aveiro, he believed that it has improved among the university students. He felt that ESP for Telecommunications was not an

essential part of their university education, but it was an important asset for their studies. Nevertheless, he considered the English language essential for the development of technology and innovation, since all documentation is written or translated into English.

In general, despite the fact that "Innovation speaks English", the professor stated that it was not essential for the university students, who are the future of technology and innovation, to have specific knowledge of English applied in this area.

## Analysis of questionnaire data

I firstly present the analysis of the students' questionnaires, since I consider them to be my 'means to an end' public, despite the fact that the engineers are the ultimate stakeholders in this project. Consequently, I was very curious about the new light that the answers to the questionnaires would shed on my work.

### 3.2.1. Analysis of results obtained for Students

The following groups of students study Electronics Engineering in the area of Telecommunications at the University of Aveiro. Electronics Engineering is a professional engineering course that deals with the study and application of electricity, electronics and electromagnetism. Telecommunications is a sub-section of this area and it is related to the transmission of information across a channel such as a coax cable, optical fibre or free space.

## A. Profile

I began the questionnaire of the student respondents, as in the other questionnaires, with the students' profiles. My first question referred to the first year of contact with the English language, since this was essential for me to glean the number of years that students had had and, so I could deduce their level of English. The majority of the students began learning the English language in the fifth grade, when Portuguese students usually begin to learn a second language. Consequently, they have studied English for six to nine years by this time. The third question was related to the type of institutions or learning contexts, in which they had learned English, in the sense of discovering the type of language education that the respondents had. Predictably, students who went to a state school since the fifth

grade do not have the same language fluency as students who started learning English in kindergarten or in a language school in parallel to their regular studies. I also looked to identify the students who had always been taught General English or had also been taught English for Specific Purposes in a vocational school, for example. Most of the second year students and the fifth year students learned General English in Elementary School (5th and 6th grades), Middle School (7th, 8th and 9th grades) and High School (10th, 11th, and 12th grades). It is curious to see that there are less second year students learning English in language schools in comparison to the senior students, who had private tutoring for the English language.

Figure number four refers to the institutions/ learning contexts mentioned before:

## Figure 4 – Learning contexts

**Explanatory caption – Qualitative variables referred to in figure 4**

a) Kindergarten

b) Elementary School (1st, 2nd, 3rd, and 4th grades)

c) Elementary School (5th and 6th grades)

d) Middle School (7th, 8th and 9th grades)

e) High School (10th, 11th, and 12th grades)

f) Vocational School (10th, 11th and 12th grades)

g) *Instituto de Formação Profissional*

h) Language School

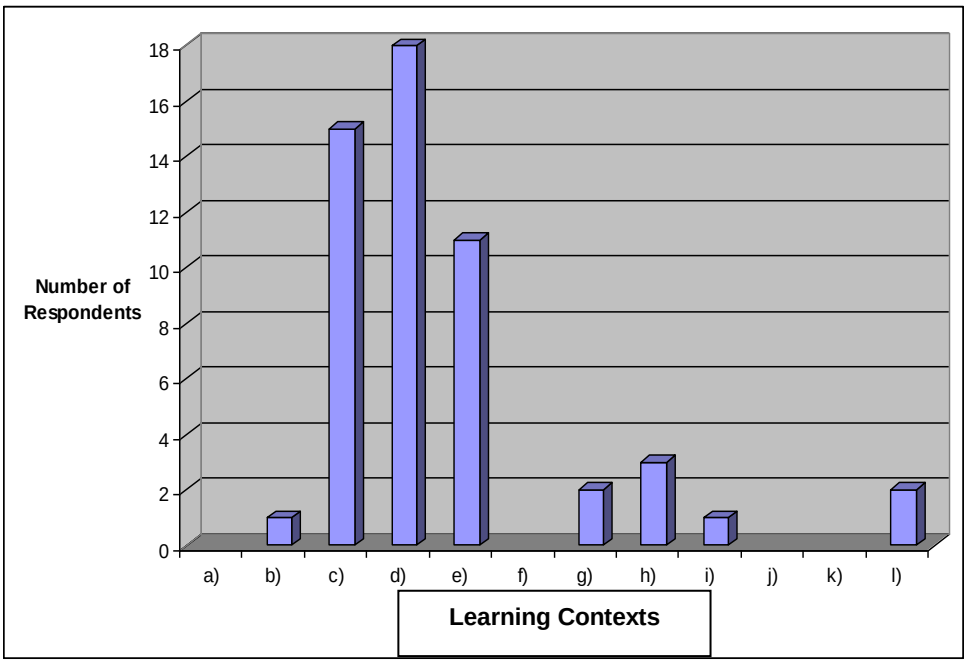
i) Tutoring

j) English-speaking country

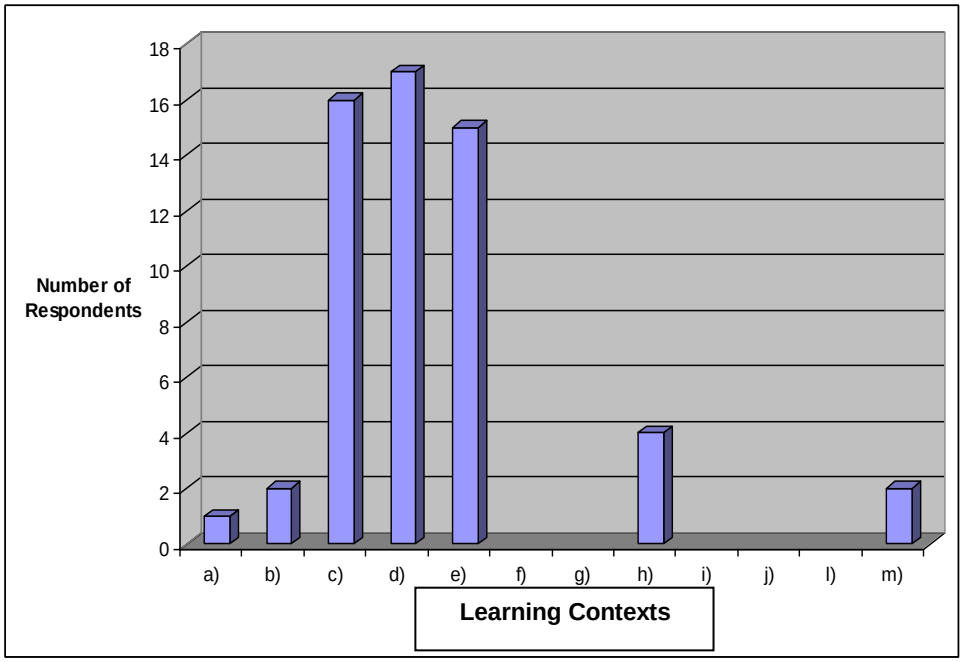
k) Never studied English

l) Other

Second Year Students



Fifth Year Students




## B. English language use in specific contexts

The second part of the questionnaire referred to the use of the English language in specific contexts. Whereas in the questionnaires posed to the engineers, the language used was characterised by the branches of ESP, which are English for Occupational Purposes (EOP) and English for Science and Technology (EST), I will look into another branch of ESP, such as English for Academic Purposes (EAP) in this section. I mentioned that English has become increasingly dominant as a world language in various areas and, obviously, higher education is one of these areas. This means that these engineering students, whose mother tongue is not English, will have to develop a level of fluency in English that will permit them to be successful in their studies as well as in their careers. In the following question, students were asked about the subjects in which they had to make use of their English skills in order to identify their objective needs and target situation. *Electronics, Digital Systems, Signal Processing, Guided Propagation, Interfaces and Peripherals* and *Telecommunication Systems* are the subjects chosen by both second and fifth year students. Of course, a large number of senior students chose most of the subjects not only because they are in their last year of university but also due to the fact that the level of exigency is higher. This is displayed in the course curriculum that was established during the years

2005 – 2007 (see appendix II). I verified that English was an optional subject that could be taken in the last year of the course. The new course curriculum of 2008, covered by the *Bologna Process,* does not have the English subject as an optional subject. The subjects studied at university are:

a) Electronics

b) Digital Systems

c) Systems Theory

d) Electronics Theory

e) Guided Propagation

f) Electromagnetism

g) Signal Processing

h) Interfaces and Peripherals

i) Operative Systems

j) Distributed Systems

k) Control Systems

l) Telecommunications Systems

m) Other subjects: Mechanics, Calculus, and End – of - Course Project

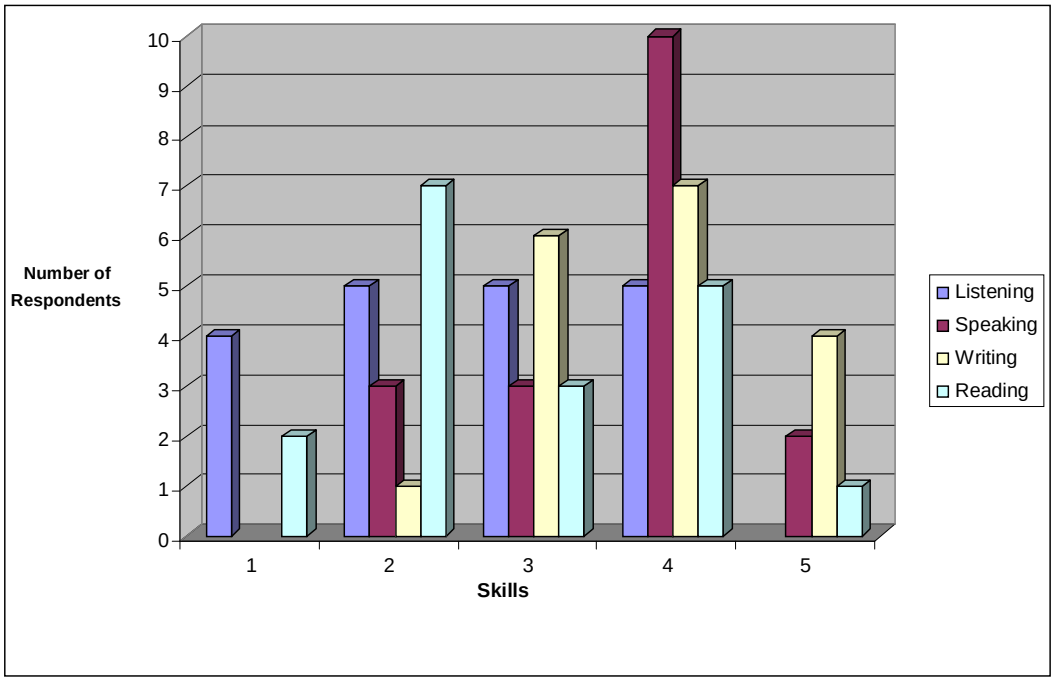
Academic English, in this case, is a collection of genres generated in English, each of which is produced to meet the functional requirements and social conventions of an academic discourse community. Being familiar with these conventions and rules of academic English is important for student's progress. These engineering students require an increasing range of skills to stay competitive within the global environment of the new millennium. English for Specific Purposes, in particular, focuses the learner's attention on the particular terminology and communication skills required in the international professional field.

Concerning figure number five, when asked about the skills which are usually used in their academic career, both junior and senior students revealed that listening and reading are

skills that are relevant in their studies. I verified that the junior students were not as representative as the senior students when asked about communicative skills. They were, however, very direct in affirming that speaking and writing skills were rarely or never a part of their studies. Eleven fifth-year students found listening to be very frequent in their studies and nine students of the same year thought reading was a very frequent skill used at university. Based on this question and the following questions in this section, I will develop a study on the importance of the four communicative skills in these students' academic success.

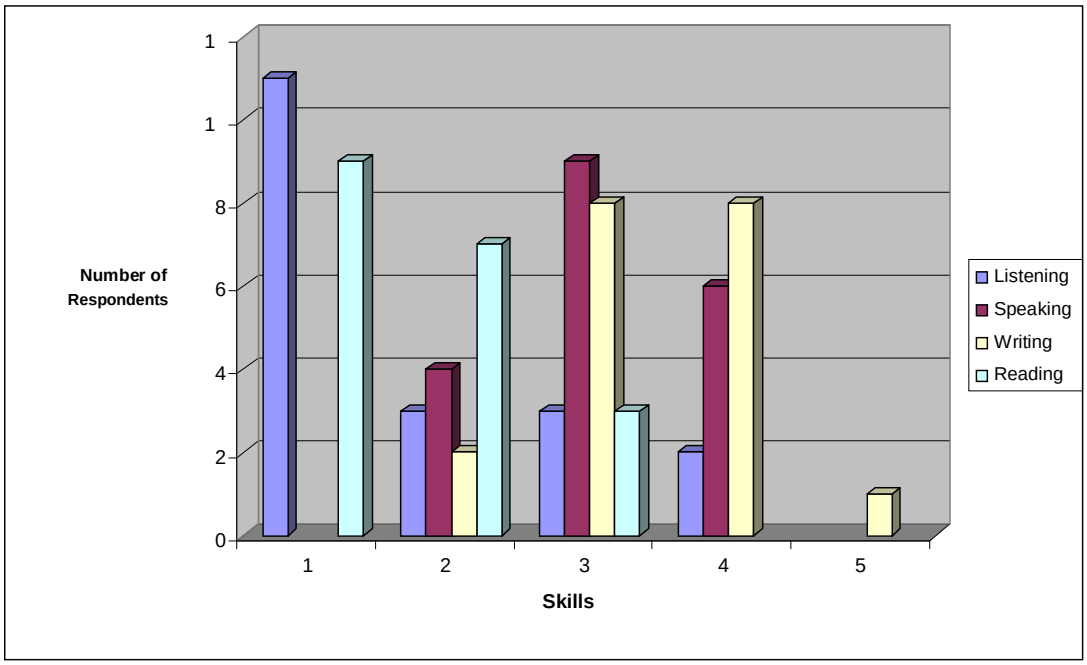
## Figure 5 – Skills used in an academic context

Second Year Students




**1=Very Frequently; 2= Frequently; 3= Not frequently; 4=Rarely 5=Never**

Fifth Year Students



Oral fluency remains the most difficult area for a vast majority of learners. The most persistent problem for the students was the inability to express themselves adequately in the spoken language, especially in academic discourse. Students spend little time actually speaking English in a typical day, but when this happens, it is to socialise. With regard to socialising, 12 second - year students and 13 fifth- year students admitted to socialising in English. I believe this is true because of the Internet and the globalisation of communications, as I have mentioned in the introduction, but it is also due to the European educational programmes, such as *Erasmus (European Community Action Scheme for the Mobility of University Students)* that has the aim of encouraging university students' and teachers' mobility inside Europe. Socialising is an 'escape' from academic speech, which has a very formal or neutral register. Nevertheless, in this case, the speed of reaction in communicating is the big weakness for students and not as much the use of appropriate language.

Additional to socialising, students are also expected to ask questions in lectures, participate in conferences, classes or discussions, or make oral presentations. Oral presentations are an integral part of students' learning skills in higher education, aside from reading skills, which they have to acquire in order to succeed in their studies. Students are expected to be able to contribute to class discussions, group work and present their individual projects to the class. I think that students try to hide from speaking skills more than any other skill especially because of their fear of failing in this area, so there are three respondents that claim they have never used this skill before. Additionally, another area of difficulty for students is verbalising data, such as equations and formulae that can appear in graphs, tables, charts, etc. in oral presentations, instructions, descriptions, or questions.

Listening is ranked as a major requirement for success in university and it cannot be dissociated from speaking skills. In figure number five, students chose listening as the skill that they most commonly use because it is, in fact, an active process that constantly puts students to the test. Participation in meetings, classes, conferences, academic debates or discussions, as well as in project presentations is some of the communicative contexts in which students make use of their listening skills. Like the majority of second and fifth year students, I see it as an area of major difficulty for them. Essentially, some students do not participate in these contexts due to not understanding spoken English and the inability to

formulate an idea in English. Understanding a verbal message can be very complex for ESL learners, as it involves the ability to:

- Identify the central theme, main ideas and supporting details;
- Concentrate on and understand long speeches;
- Identify the level of formality;
- Deduce incomplete information;
- Deduce unfamiliar vocabulary.

## Figure 6 – Contexts of Oral Genres

**Explanatory caption – Qualitative variables referred to in figure 6**

a) Socialising

b) Participating in meetings, classes, and discussions, etc.

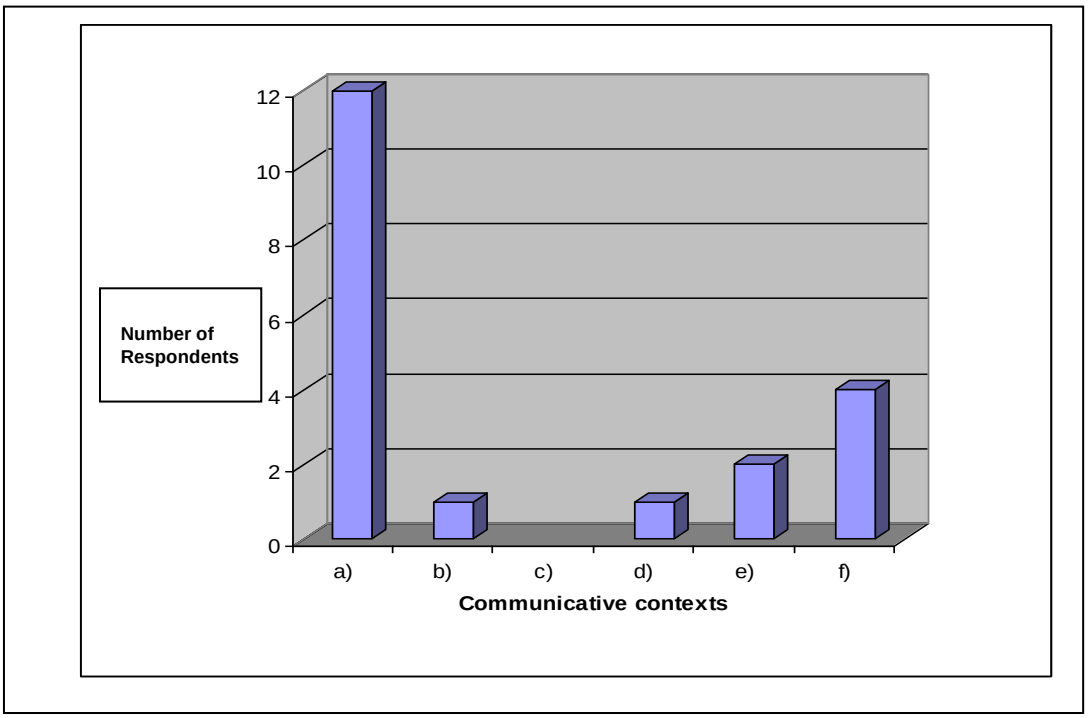
c) Participating in conferences and scientific debates

d) Presenting projects

e) Explaining machine performance

f) Other contexts: never used this skill (3), at home (1)

Second Year Students




Fifth Year Students

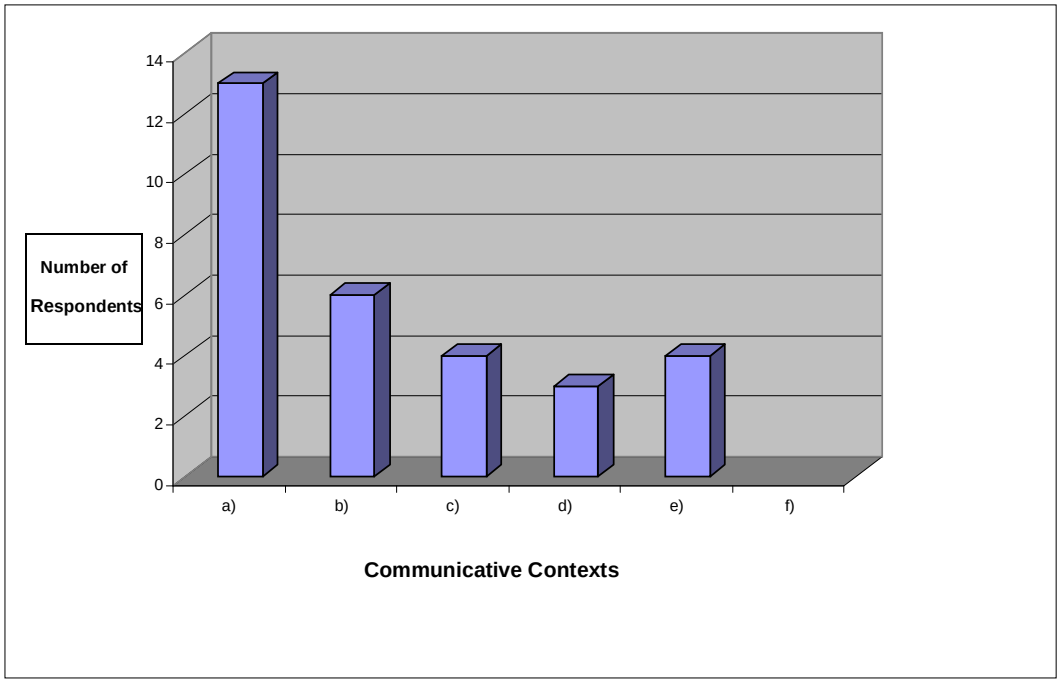


Figure number seven refers to *writing skills*, which are the most challenging at a tertiary level. The majority of the students chose writing correspondence as the main context used in English. This context is associated with socialising and communication through the Internet in General English. Once again, the widespread use of computers and the Internet has raised the profile of writing and the need for effective communication.

The type of genres that students are expected to become familiar with at an academic level, and able to produce, include the following: essays, reports, projects, research papers and abstracts. Each of these has its own content structure or format, style, and various conventions. The structure of the writing will vary according to the particular genre. English for Academic Purposes focuses more on writing techniques such as process and development of ideas, logic, and vocabulary appropriate to particular academic contexts. Nevertheless, as I referred in figure number five, written genres are rarely developed in the Portuguese context at this specific university degree.

## Figure 7 – Contexts of Written Genres

**Explanatory caption – Qualitative variables referred to in figure 7**

a) Reports

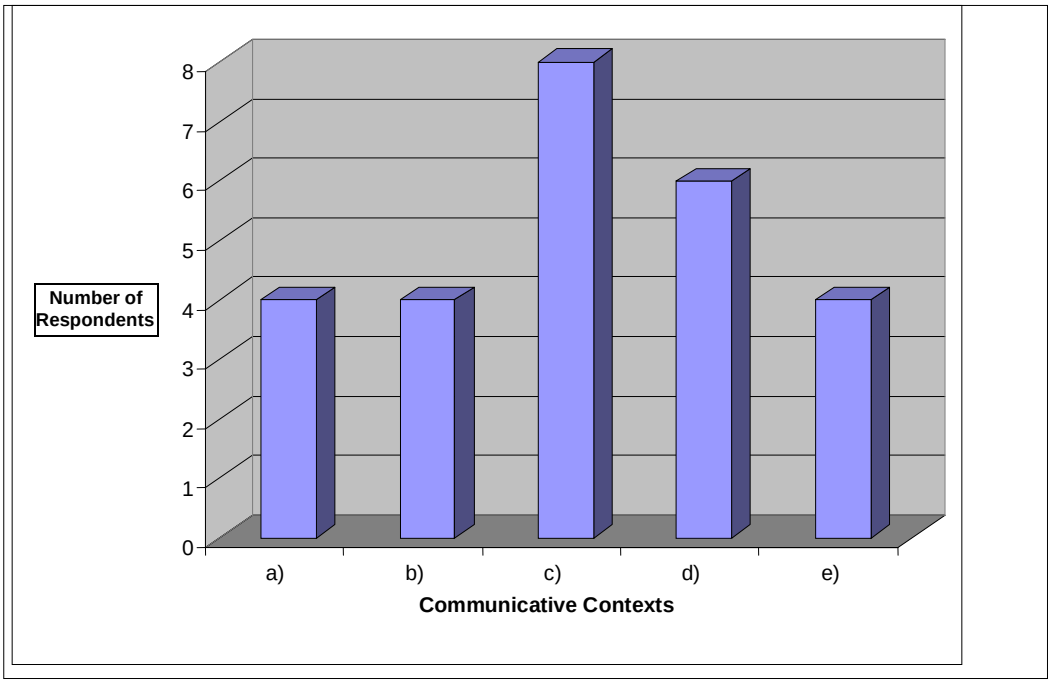
b) Scientific articles and papers .

c) Correspondence (emails, formal and informal letters)

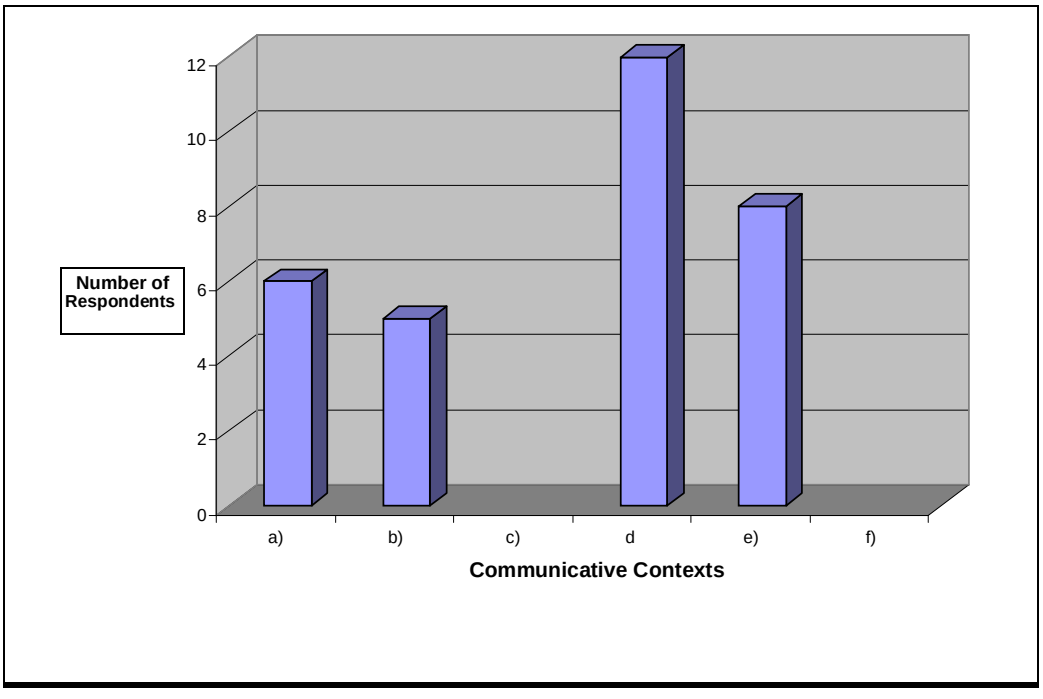
d) Questionnaires and Forms

e) Other contexts: never used (1); the Internet (1)

Second Year Students




Fifth Year Students



Concerning the question related to reading genres, the majority of the students thought that genres, like instruction manuals, scientific bibliography (books, articles, catalogues, magazines, etc.), software manuals and Internet sites were the most necessary at this university level. As one of the fifth year students (005) wrote about the importance of English for Specific Purposes for Telecommunications,

> *"(A língua Inglesa é importante) uma vez que recorremos muitas vezes a artigos técnicos e científicos para justificar ou compreender certos trabalhos práticos, e, estes são na maioria em Inglês."*

## Figure 8 – Genres which require Reading and Understanding skills

**Explanatory caption – Qualitative variables referred to in figure 8**

a) Correspondence (e-mails, formal and informal letters)

b) Instruction manuals

c) Machine warnings

d) Scientific Bibliography (books, articles, catalogues, magazines, etc.)

e) Protocols

f) Software Manuals

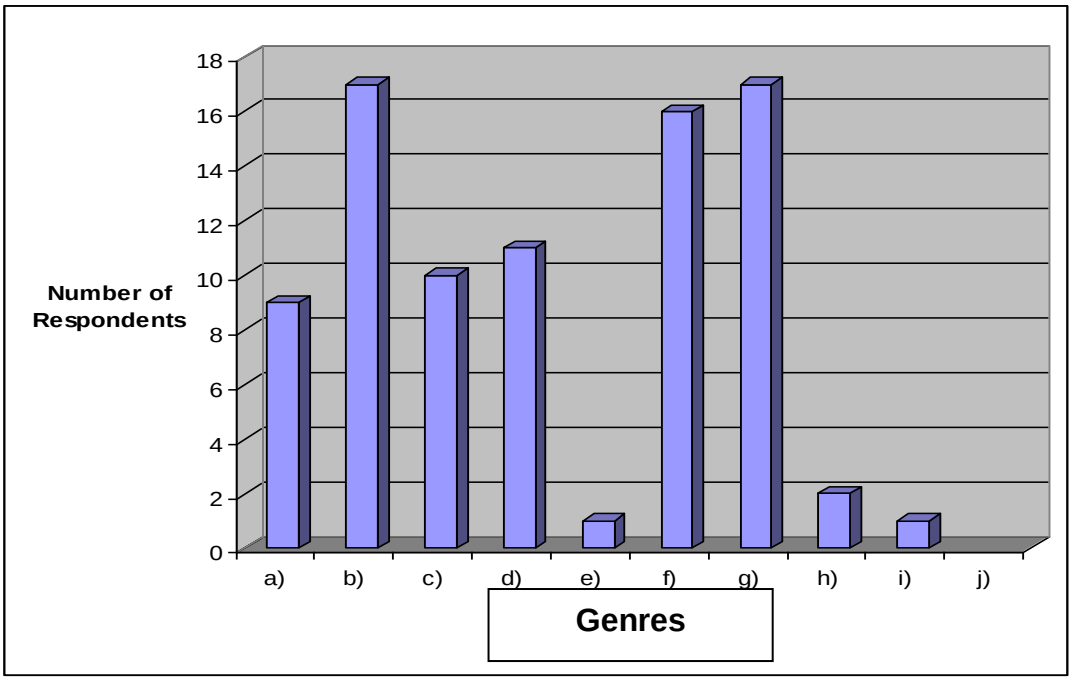
g) Internet Sites

h) Informative Pamphlets

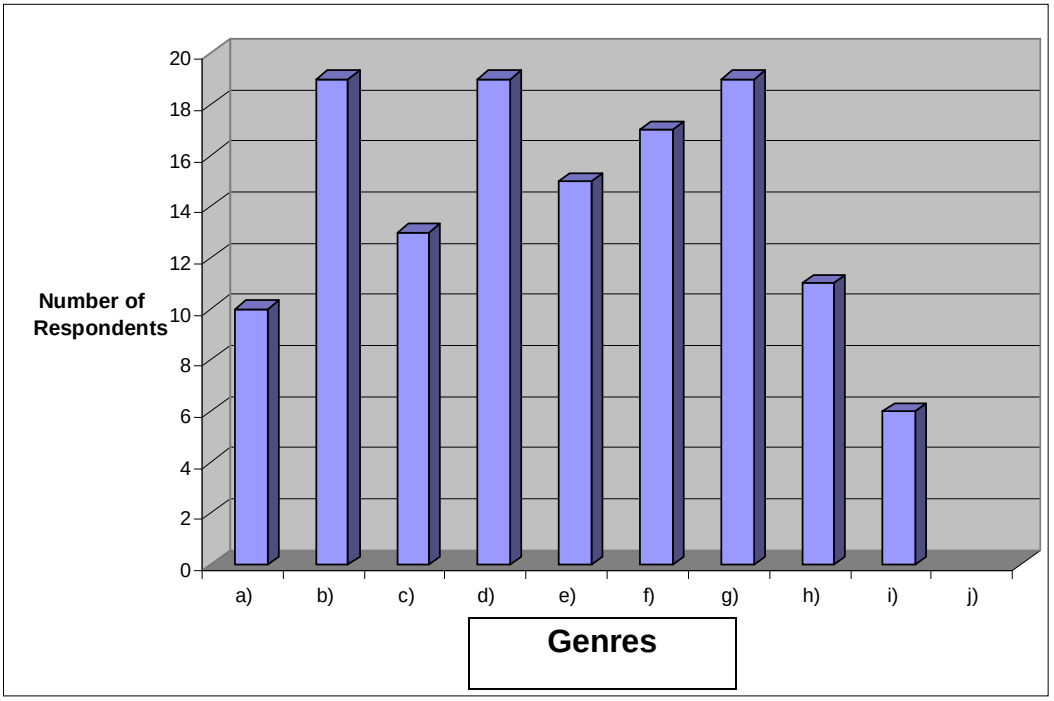
i) Questionnaires and Forms

j) Other genres.

Second Year Students




Fifth Year Students



Reading is a fundamental characteristic of the target academic situation, in which students typically read books and journals, or read/ write notes, summarize, and paraphrase, etc. Undoubtedly, students can have different purposes in their reading, these will include:

- to obtain information (facts, data, etc.)
- to understand ideas or theories
- to discover authors' viewpoints (and to quote), all of which may be needed for exams, essays and projects.

In academic or professional settings, readers usually produce information from multiple reading sources, from different parts of a long and complex text, or from a prose text and accompanying diagram or chart. Such reading is quite different from searching, skimming, or reading for general understanding. William Grabe and Fredericka L. Stoller (2002) believe that reading purposes can be classified under seven main headings, while recognising that these headings are related and many variations could be suggested:

1. Reading to search for simple information
2. Reading to skim quickly
3. Reading to learn from texts
4. Reading to integrate information
5. Reading to write (or search for information needed for writing)
6. Reading for general understanding (Grabe & Stoller, 2002: 11-15)

ESP reading is not considered easy for these learners, but by skimming and scanning for the main idea, key words, and /or concepts in passages, the students activate and form reasonable ideas and conclusions about the content of the text. Efficient reading sometimes requires the reader to deduce the meaning of unfamiliar terms through contextual clues, or prefer to translate ESP passages word for word. Students tend to rely on the dictionary rather than deal with new vocabulary independently, and take for granted most of contextual clues and textual redundancy, as Dudley - Evans & St. John (1998: 83) stated:

> *In comprehension, deducing the meaning of vocabulary from the context and from the structure of the actual word is the most important method of learning new vocabulary.*

In question number six, I asked the students to grade the required skills and communicative contexts in order to support and substantiate every idea that was brought up in this section of this study. By analysing figure number nine, I confirmed the fact that reading was the most essential learning skill for the students, especially for the second year students. The figure also illustrates the fact that the fifth year students find every communicative context important due to the fact that their level of English should be more proficient than the level of the junior students. Additionally, the seniors have reached a stage of their studies that allows them to have a broader notion of what is crucial for their future in the job market.

I noticed that the context referring to the understanding of English grammar was seen as not very important in relation to the other contexts. I decided to add the option "understanding English grammar" in order to assess whether at this tertiary level of education, students and working engineers need to worry about the use and functioning of the language to express their ideas or to perform their activities successfully. This option was purposely placed in this question because I wanted to demonstrate that in an ESP context a general English grammar may not be helpful, as was mentioned in section 2.1.4. Learners "must look beyond the grammatical level to see what function the structure has in the text which is taken." (Kennedy & Bolitho 1984: 19).

## Figure 9 – Required Skills and Communicative Contexts

**Explanatory caption – Qualitative variables referred to in figure 9**

a) Reading and Understanding scientific documentation

b) Reading and Understanding software manuals

c) Reading and Understanding machine instructions

d) Understanding the English grammar

e) Writing scientific texts

f) Presenting projects

g) Socialising with people from different cultures

h) Using technical terms in the area of Telecommunications

i) Understanding oral instructions

j) Understanding written instructions

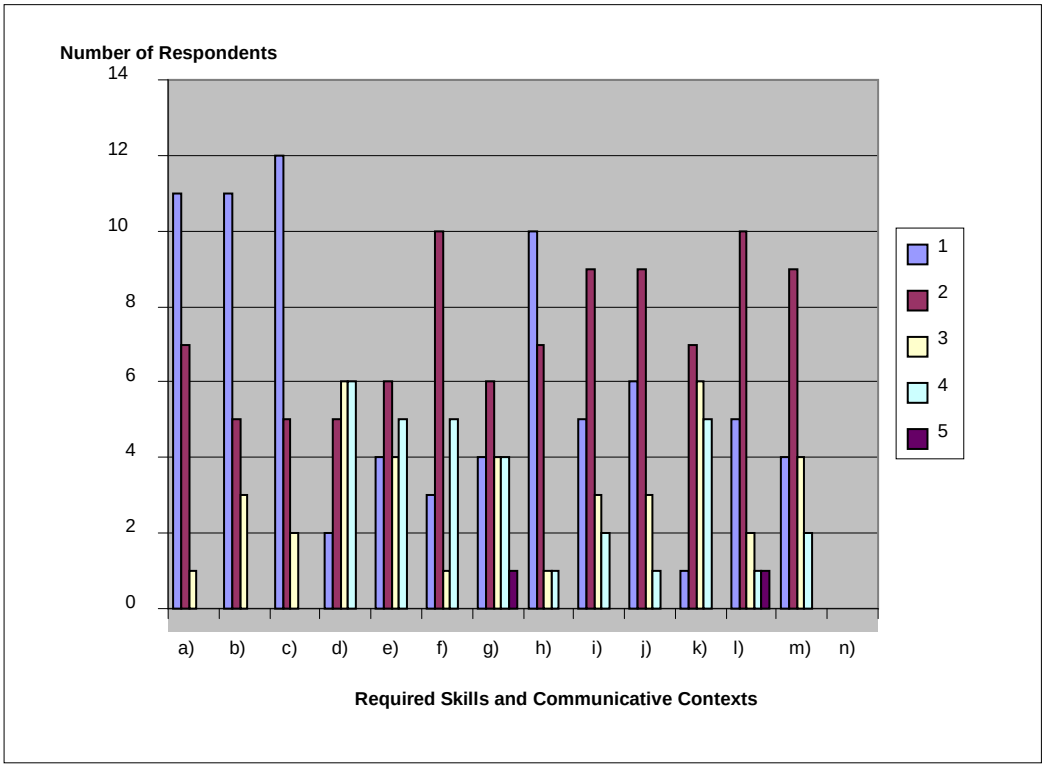
k) Participating in conferences

l) Searching for specific information on the Internet

m) Understanding a class taught in English

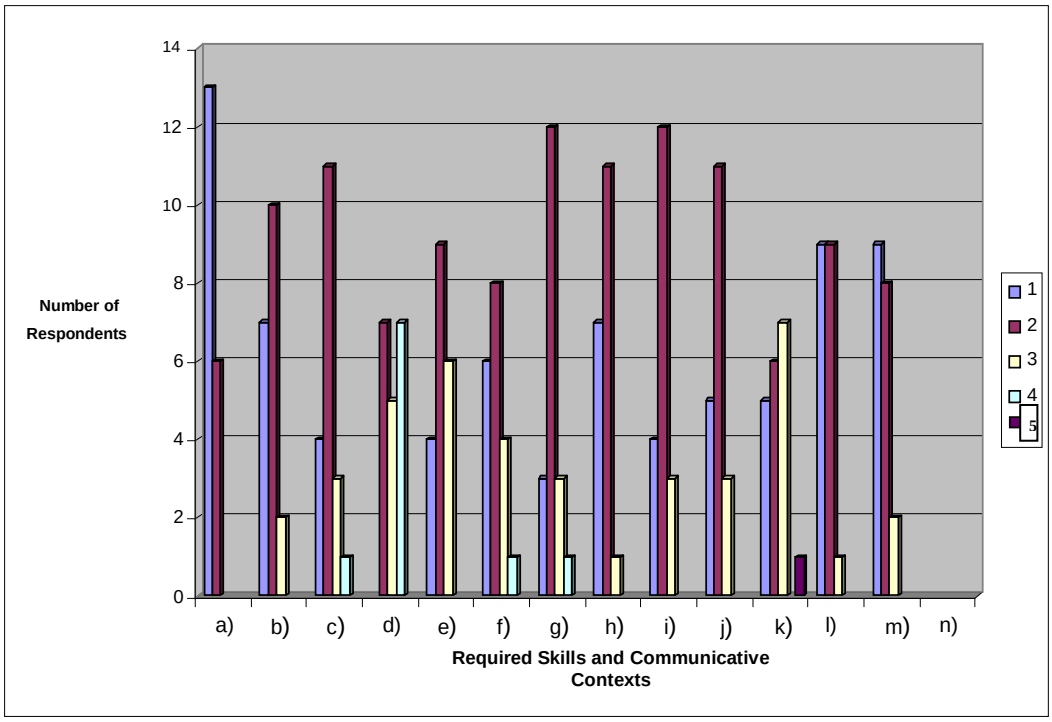
n) Other contexts

Second Year Students




***1=very important; 2= important; 3= not very important; 4=not important; 5=not important at all***

Fifth Year Students



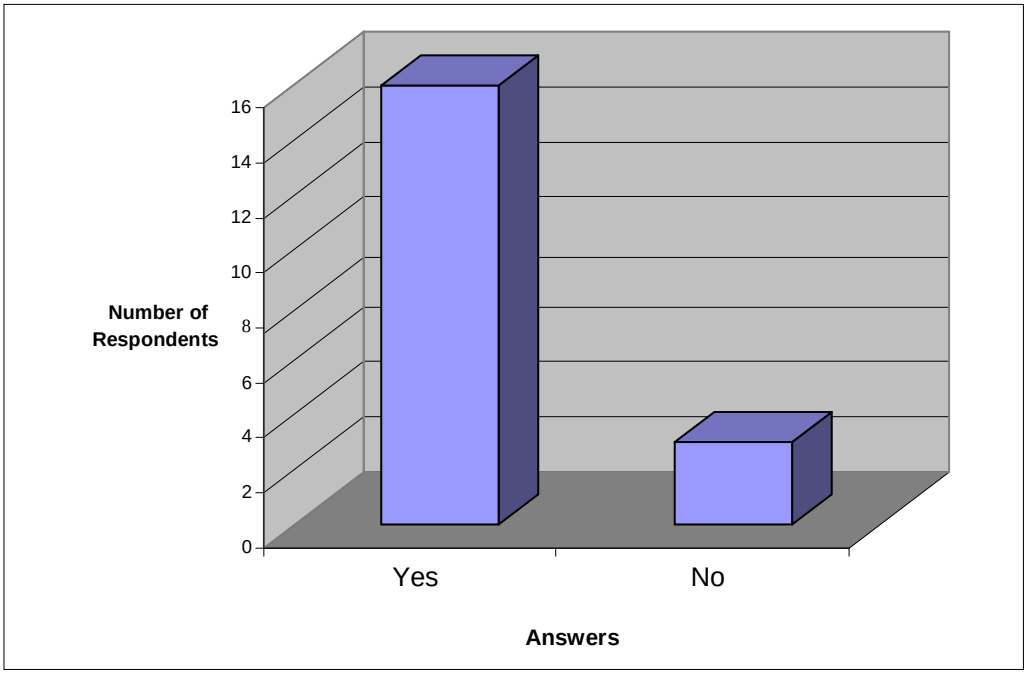
## C. General Considerations

Regarding the following question, the two groups of students were unanimous when enquired about the importance of ESP in their studies. From these results, I deduced that the students are aware of their need of good English language knowledge at university in order to be successful in their future workplace. Education at the university is a crucial stage because, at this level, students are preparing to enter into another phase of their lives, that is, their future careers, and therefore, they have certain subjective needs and wants of what they want to learn and achieve in their learning process. The learner's needs of the students are crucial to ensure that learning takes place and that they achieve their long-term goals. Besides that, they also realize that there are immense opportunities in terms of their career for English language learners, as this senior student (013) summarized:

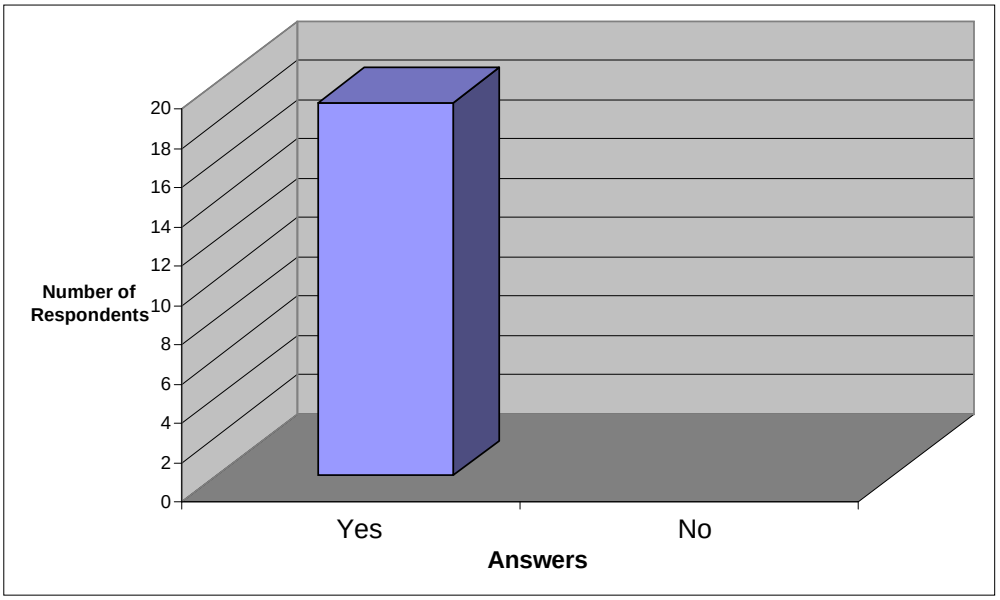
> *" (A área de Telecomunicações) é uma área globalizada e por isso usa a língua Inglesa como meio de comunicação, daí o benefício para quem já domina a língua inglesa."*

**Figure 10 – The Importance of ESP for Telecommunications**

Second Year Students



Fifth Year Students

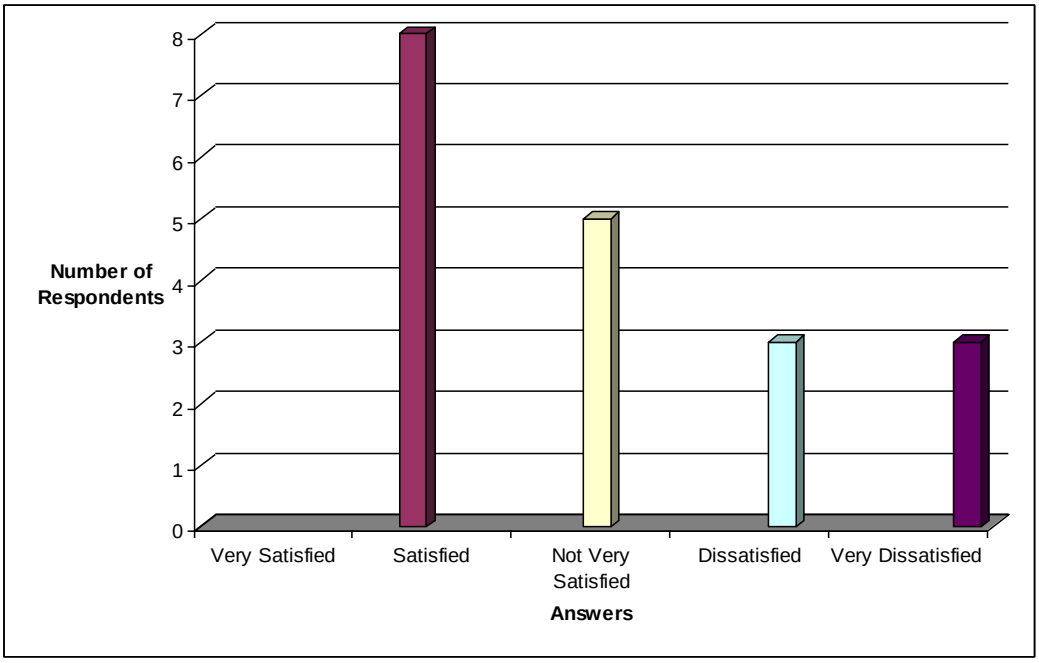



When analysing the answers given to the following question, in which I asked students to evaluate their knowledge of English, I could see that, even though they are not frequently in touch with the language, the majority of the respondents think that they have a satisfying level of English due to their six to nine years of language learning (see Students' Profile section). Students claimed that, in general, their English level allowed them to read and understand English documentation clearly. One of the senior students (012) summed it up in an adequate form:

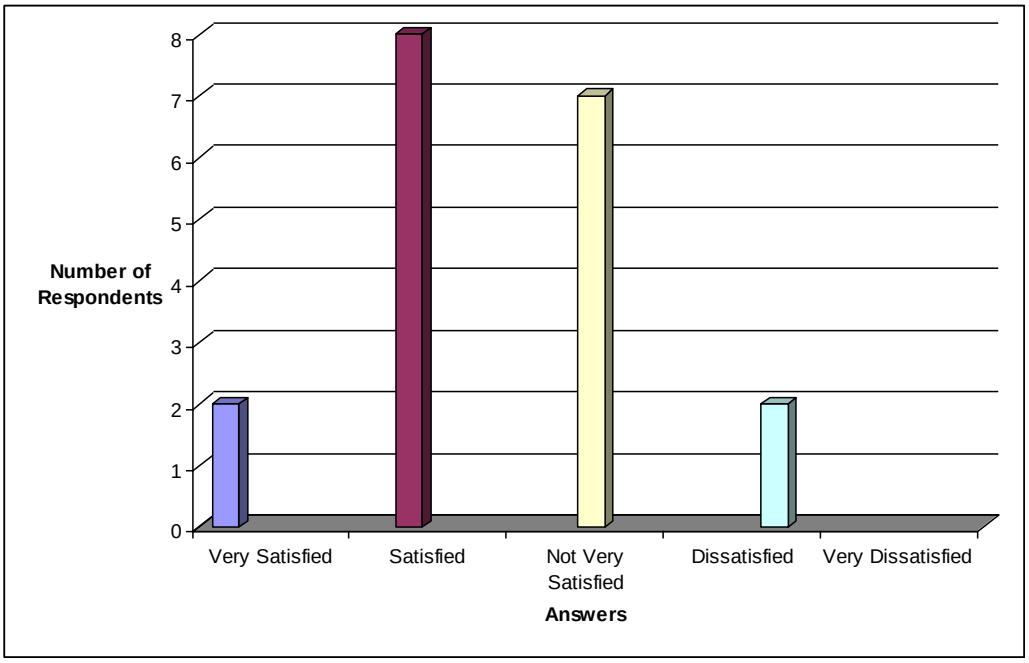
> *" (Sinto-me satisfeito com o meu nível de Inglês) porque, de um modo geral, consigo compreender a informação geral e específica que consulto em língua inglesa."*

## Figure 11 – Students' opinion on level of English

Second Year Students



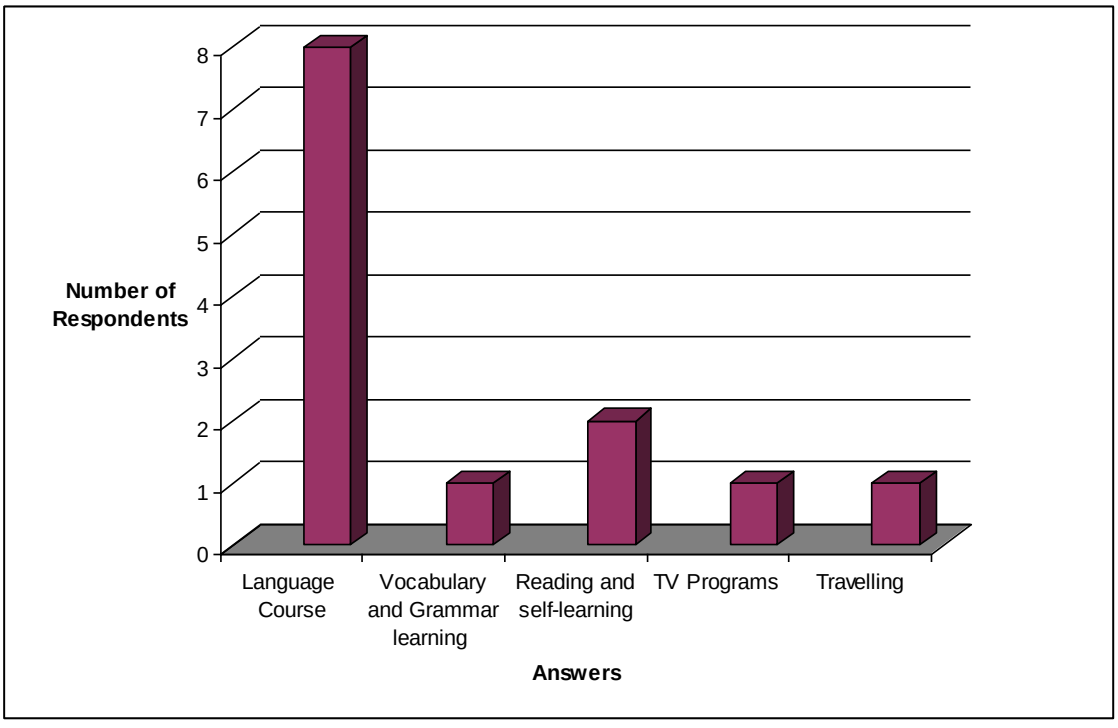

Fifth Year Students



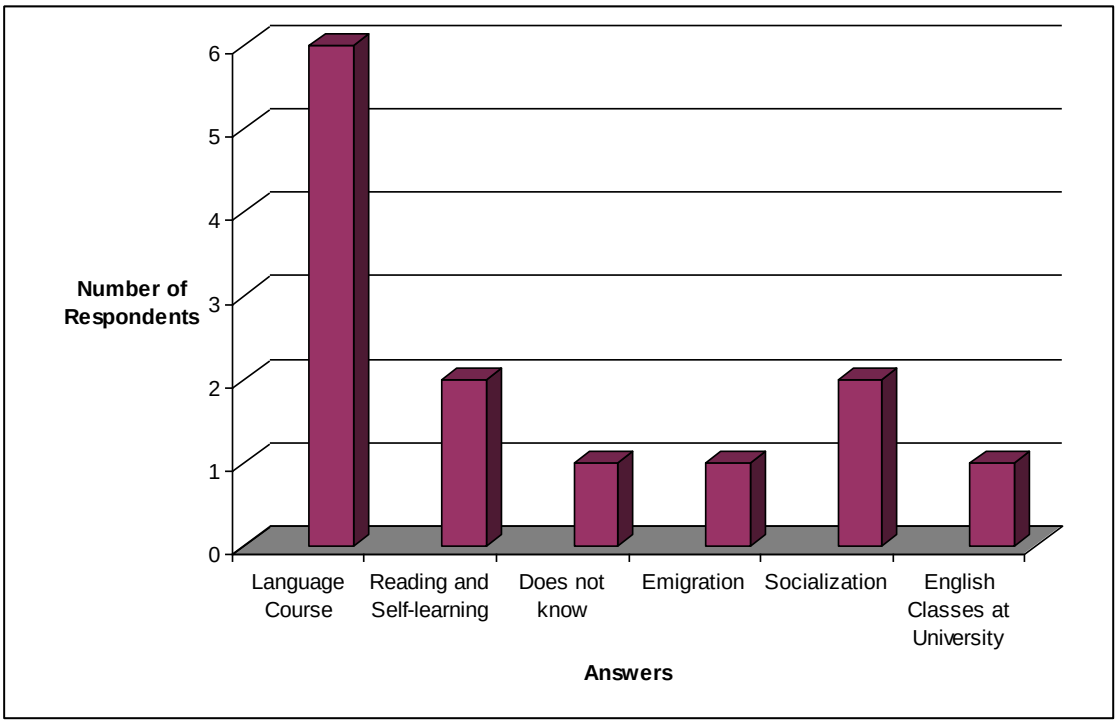
Keeping in mind that my survey was undertaken with university students who do not have the English language in their curriculum, unless they choose it as an option in the last year ($5^{th}$) of the course (see appendix II), I posed the following question: "In a life – long learning perspective, how do you intend to continue your English language learning?". As a result, the majority of the students believe that taking a course at a language school was the wisest choice. English deserves more attention at the tertiary level and this reinforces the claim supported by ESP teachers who continue to demand a more frequent presence of a foreign language when students are at university. Only one of the respondents suggested that students should learn English at university or in the future workplace, which confirms that students do not have access to English language courses at university, and consequently, do not believe that this will change in the near future with the *Bologna Process*.

**Figure 12 – How to Continue English Language Learning**

Second Year Students



Fifth Year Students




### 3.2.2. Analysis of the results obtained for Engineers

The findings relating to the companies I questioned were extremely helpful and gave me a clearer idea of the actual situation of the English language in the workplace, in this sector, nowadays. The descriptive features of those polled are 100% male respondents, aging between 25-45 years old. Seven respondents studied Electronics Engineering and Telecommunications at the University of Aveiro, whereas the other fourteen studied Electrical Engineering and Computers at the University of Coimbra (four), the University of Oporto (six), and *Instituto Superior Técnico* in Lisbon (two). Two of the respondents did not include information on this point.

I chose to describe the companies that were included in this project not only as an acknowledgment of their participation in this project, but also to give a brief explanation of who they are and what they do for the general public and for the Portuguese economy (see appendix V). The given information shows that many of the multinational corporations, such as *Grupo Vodafone*, Ericsson Telecommunications or *Grupo PT* perceive the English

language as the *lingua franca* of telecommunications and seek collaborators with a more multilingual profile. On the other hand, the Small and Medium-sized companies (to know more about these definitions, see table four), in general, have to survive and even develop skills to succeed in the telecom market while using its *lingua franca.*

As ESP is "an approach to language teaching in which all decisions as to content and method are based on the learner's reason for learning" (Hutchinson & Waters, 1987: 19), I decided to identify the engineers' study needs through questionnaires and interviews.

I will now take a deeper look into the results that I obtained from the written questionnaires distributed among the engineers. I felt that these opinions were very valuable because these engineers have experienced both worlds, the academic and professional contexts, which have made them true specialists when referring to the importance of ESP for Telecommunications.

## A. Profile

In relation to the job positions occupied in the companies, there are a total of 21 Telecommunications engineers: six Technical Service engineers, two International Technical Support engineers, two Support Services engineers, two Information Systems Negotiators, a Systems Integration engineer, a Telecommunications engineer, a Network Services Support engineer, a Systems engineer, an Information Analyst, a Sales and Technical Manager, a Quality and Informatics Director, a Director of Information Systems Negotiating and one unknown respondent.

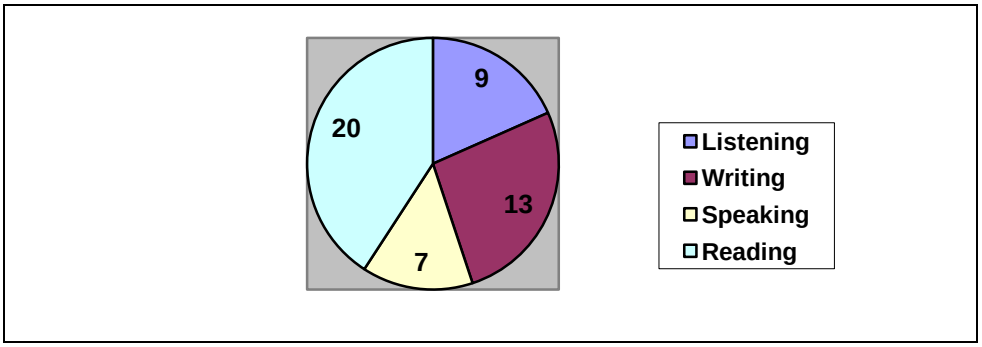
## B. English Language Use in Specific Contexts

As I have presented in my theoretical framework, needs analysis is the process of establishing the *what* and *how* of a course. I have described both of these factors in the previous sections and I will now look into the *why*. It was evident that the role of needs analysis in this ESP setting was crucial, as the focus of this study was very much on the learners themselves, *language* and *communication skills* and *genres*. I realised that analysing the language prerequisites and requisites in a profession is as important as it is to match needs to contents necessary for an ESP course. As Dudley – Evans and St. John (1998: 24) propound:

> *The main principle of the skills approach is that the teaching of language in itself is not sufficient for the development of the ability to communicate or perform the tasks required in a university student or an engineer. The basis of the approach is that, in addition to language work, there is a need to address the thought process that underpins language use.*

My first question was related to the use that the engineers make of the four communicative skills (speaking, reading, writing and listening) within the workplace and it was posed to obtain more details about the real application of ESP in the workplace. A representative 20 engineers frequently needed to read in English when they were working while seven engineers stated that they needed the language orally. Thirteen engineers found writing to be important and nine engineers use listening skills. In general, reading and writing skills are used every single working day, while listening and speaking are used occasionally.

**Figure 13 – Skills used in the workplace**




The strength of ESP lies in enabling the scientist or technologist to communicate confidently with his/her colleagues about specialist fields or studies, in speech or writing. During the process of writing and speaking, these engineers will constantly ask themselves the question "what do I need to explain to make the message clear?". At the same time, they will also ask themselves the question "what do my peers expect from me in terms of layout, organisation and structuring of the argument, or to include in terms of content?". In general, the needs analysis has to take the academic and professional contexts, in which the following skills and genres exist, very seriously.

In the earlier years of ESP development, spoken interactions received almost no attention (Dudley-Evans & St. John, 1998: 106). Nonetheless, due to our global and competitive world, spoken interactions have become of paramount importance in English language learning. Communication in the working world relies heavily on the use of spoken language, since it is especially valuable in decision-making and creative research environments. Additionally, it is faster and often more convenient than written communication and it facilitates immediate feedback and clarification. Engineers should be prepared to take part in group discussions and ask the right questions in daily professional contexts. In addition to being one of the most essential skills for employment, oral communication skills are vital to job success and promotion.

The term contexts of oral communication refers to communicative events engaged in by these engineers in the workplace, such as telephone conversation, meetings, formal discussions, presentations, social interactions, oral instructions, interviews, etc. The term *skills of oral communication* includes the following: listening skills, conversational skills, giving feedback, meeting skills, presentation skills, negotiation skills, solving technical problems with fellow workers in the same company or with workers of other companies, giving technical instructions on machines, training skills, interviewing skills, persuading skills and promoting one's own strengths and abilities.

Regarding figure number 14, this is the second most varied figure in this study, after reading and understanding contexts, since over seven workers use about eight speaking contexts.

## Figure 14 –Contexts of Oral Genres

**Explanatory Caption – Qualitative variables referred to in figure 14**

a) Telephone conversation

b) Participating in meetings and (video) conferences, etc.

c) Participating in trade/industry exhibitions and congresses to present products and carry out client prospecting

d) Participating in exhibitions and congresses to gather information and establish informal contacts

e) Solving technical problems with fellow workers in the same company

f) Solving technical problems with workers from other companies

g) Providing vocational training

h) Giving technical instructions about machines

i) Providing information on the working conditions inside a company

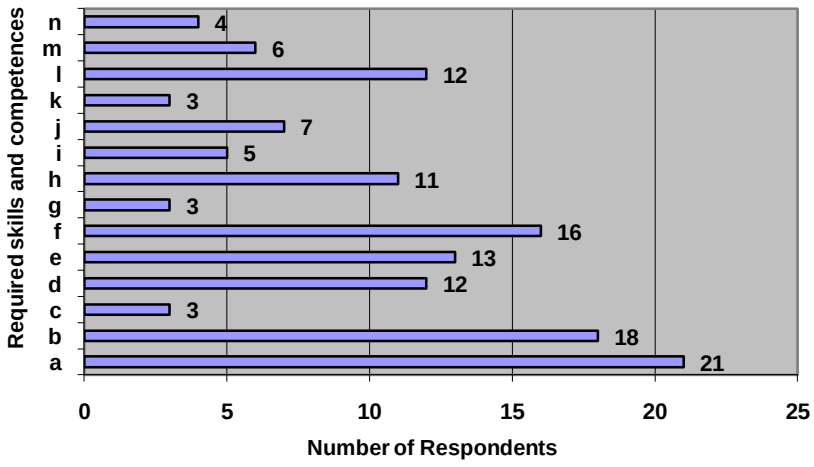
j) Participating in the solution of interpersonal problems

k) Job interviewing

l) Socialising with people from different cultures

m) Giving speeches

n) Other contexts: Negotiating



This meant that these contexts of oral communication were widely used and engineers came across at least four of these contexts on a daily basis. As there are five International Support engineers, three Support Services engineers, two Systems Negotiators, a Technical Server engineer, a Network Services engineer and a Manager related to sales and quality, oral skills proved to be fundamental in their line of work. These engineers have to serve their company and other companies in the best way and, so the oral contexts (telephone conversation, participating in meetings or (video) conferences, or solving technical problems) within their own company or with other workers from other companies were used on a daily basis. Consequently, the polled results regarding the contexts of oral genre were essentially telephone conversation and participating in meetings or (video) conferences. I also verified that engineers were busy with client contacts (socialising, telephone contacts, having group discussions, making oral presentations and negotiating). I will characterise the most popular contexts among the respondents in the following segment:

**a) Meetings**

A meeting within a company may serve various purposes, such as the exchange of information, decision-making, or an oral presentation from an individual or a group. As with telephone conversations, meetings involve one-to-one interactions and, in accordance with the abovementioned contexts, the language used is highly professionally driven. Speakers should articulate their ideas effectively and at the same time show some spontaneity even though some part of the interaction may be prepared or even rehearsed. At meetings, engineers have to be prepared to communicate the following:

a) Ask for opinions;
b) Present and support opinions;
c) Agree or disagree with some opinions;
d) Present a balanced point of view;
e) Point out consequences on a matter;
f) Make suggestions;
g) Ask for suggestions;

h) Present a number of different solutions;

i) Justify these choices or solutions;

j) Warn about negative results;

Meetings are also built on language skills and confidence, as well as structuring, visuals, voice, and advance signalling. In addition, meetings are filled with unfinished sentences, false starts, interruptions, redundancy, repetition, and lengthy explanations. These are all skills that engineers have to control in order to communicate fluently and, therefore, 'get things done'. Repetition, for example, helps to communicate the essential ideas in a meeting: during a meeting speakers should say what they are talking about, say what they have to say, briefly rephrase what they have said to ensure that everyone understands each stage of their talk; and summarize the main points towards the end of their talk so that they lead to the conclusions.

**b) Telephone Conversations**

Telephone conversations are very dependent on the immediate situation, because both speakers are commenting on something occurring at the moment or relating to the speech moment and usually in the same professional context. Nevertheless, they may also be influenced by external factors: terms, cultural factors, or a bad line connection. These engineers usually make international phone calls to:

- request for information;
- clarifying a request;
- refuse a request;
- order some type of equipment;
- bring someone up to date on a technical problem:
- finalize an agreement, etc.

**c) Oral Presentation**

Oral presentations or speeches are concentrated on the stand-up moment, and the prepared talk accompanied by visuals. These presentations are required to train others, to share

information, to make proposals, to direct people, to review progress and to plan (Budinski, 2001: 265). Oral presentations of technical work can be presented to managers, other engineers inside and outside their organization, or at a technical conference/exhibition. These professionals usually face two types of oral presentations: informal and formal. The informal presentations are given to co-workers who are usually on the same team and, therefore, they do not include the same formalities and details of a formal presentation. Technology – based companies have a strong dependence on oral presentations, such as management briefings, technology design review, product demonstrations, marketing and business development efforts, etc. The ability to present oral information successfully is integral to corporate and individual success.

There are two types of formal presentations that engineers may have to carry out: the informative presentation and the persuasive presentation. The main purpose of an informative presentation is to give the audience information or facts, for example on the performance of a wireless protocol. Here, the presenters are expected to:

- describe and analyse the matter;
- organise the information by indicating it adequately;
- create interest by using rhetorical questions;
- contrast statements of fact with comment.

The objective of a persuasive presentation is to present strong arguments in order to 'sell' the product, be it a machine or an idea. So, the presenters need to build on their arguments in order to improve the understanding of the client and other stakeholders' needs, and they also need to discuss different options to show that their alternative is the best in that specific situation. The language used in these presentations should be enthusiastic and emphatic, and the key points should be highlighted in order to give them more impact and, therefore, be more persuasive. The ability to persuade, be it in writing or speaking, is essential to an organization, since it entails rational and emotional components.

Engineers have to outline skills in order to organise the information for their audience at the beginning of a presentation and create interest in the theme. Additionally, they should briefly summarize their main arguments and draw conclusions for the audience at the end of the presentation. Handling questions is also a part of giving a presentation: sometimes

presenters ask for questions during the presentation, but more frequently there is a *question time* at the end of the presentation. This is a particularly taxing exercise as it depends on spontaneous responses for which the speaker may not be prepared.

Oral communication is supported through a process of interaction and, except in special circumstances, such as a lecture, the participants help in its outcome. Since speech is normally spontaneous, engineers have little time to pay attention either to the organisation of the sentence structure or to the linking of the sentences - to some extent the latter is maintained through the process of interaction. A presenter repeats, backtracks and expands depending on how people react to what they say. Fortunately, incomplete and even ungrammatical utterances usually pass unnoticed unlike the writing process where the absence of those features has to be compensated.

In telephone conversation, meetings, (video) conferences, socialising with people from other countries and negotiating, listening and speaking are both required within the real time of the communicative event. In these circumstances, participants have dual roles – as listeners and as speakers. In this context as in other communicative contexts, as I will mention further on, different genres and communicative skills usually meet to fulfil the same objective.

**d) Negotiating**

As an example, meetings and negotiations are also difficult to differentiate. Alan Firth (1995) pointed out that *negotiation* takes place in many contexts and, most importantly, it may be done by meeting, telephone, fax, or e-mail.

At an opening stage of a negotiation meeting, it is important to state the objectives clearly and to agree on them with the other party. Therefore, at this early moment of a negotiation, it is generally important to create a climate of cooperation to reach mutually beneficial agreements (O'Connor: 1992: 23). Then, negotiators go on to the opening statements, which should be clear and unambiguous, since negotiators need to explain their needs and interests at this time. During the negotiation, it is helpful to check whether the information given or received is understood in order to prevent future misunderstandings. At this point, I confirmed the fact that different contexts would meet to form a perfect communicative

link, as the main function of a presentation, negotiation, or participation in trade/industry exhibitions and congresses is to present products and carry out client prospecting. The participation in exhibitions and congresses can be seen as a persuasive presentation to gather information and establish informal contacts, that is, the *presenters* aim to elicit a specific response from their audience. Exhibiting at a trade fair offers these engineers one of the best opportunities to get their product or service in front of a lot of potential customers in a relatively short period of time. Trade fairs give them the opportunity to not only show their product or describe their service, but to create that all important first impression. Engineers are in contact with potential customers, sales representatives, retailers, distributors and other key decision-makers and influencers, so their message must be clearly communicated.

Today's workplace is increasingly diverse, so workers need to learn how to work with others whose generation, culture, and primary language may be different from their own. As a result, I also verified that socialising with people from different cultures seemed to be as important as solving technical problems with workers of other companies. This appeared to indicate that good knowledge of ESP and technical terms or socialising is equally important in the professional environment. Socialising is an aspect of interaction aimed at establishing a good relationship in order to enhance the accomplishment of business. Building relationships has to do with attitudes, as are shown through features such as smiles, eye contact and topics of conversation. Every one of these features is *culture-dependent*, since building relationships has also to do with sensitivity and respect for others' values.

In addition to being one of the most essential skills for employment, oral communication skills are vital to job success and promotion. As an example, effective oral communication skills are vital to people who hold managerial positions, as are the Sales and Technical Manager, Quality and Informatics Director, or the Director of Information Systems Negotiation, because managers need to explain, listen to, persuade, guide, coach, encourage, facilitate and direct group members to meet the goals of the company and ultimately, their individual goals. Consequently, the Director of Quality and Sales at Ericsson (208) stated, when enquired about the importance of ESP:

> *"A facilidade e naturalidade com que os contactos internacionais e/ou o acesso à informação escrita forem feitos são parte fundamental do sucesso da actividade.*
>
> *O domínio da língua é um dado de base que se reflecte noutro género de parâmetros, porque me tem permitido expressar com clareza nos contactos internacionais e ler e interpretar com fluência a informação escrita."*

Speaking is the natural and normal medium of communication for people in most circumstances and it accustoms people both to having someone physically present when they use language and getting feedback of some kind. Writing, on the other hand, is essentially a lonely activity and the fact that someone is required to write on their own without the possibility of immediate interaction or the benefit of feedback, in itself makes the act of writing difficult.

I have mentioned before, in figure number 13, that 13 respondents indicated writing as the second most important skill used in the workplace, and the following figure proves that these 13 respondents are significantly represented in such genres as the abovementioned: correspondence, reports or note-taking. I believe that communication in the working world relies heavily on the use of written language. The 21 engineers have to write reports, be it in a negotiation context or a technical context. Twenty engineers need to write correspondence and 11 have to take notes. The respondents also referred to presentations, as there are three respondents linked to the negotiation sector (see figure 15).

## Figure 15 – Contexts of Written Genres

**Explanatory Caption – Qualitative variables referred to in figure 15**

a) Reports

b) Forms

c) Correspondence (formal and informal letters, e-mails, etc.).

d) Notices and/or Circular letters

e) Work agenda

f) Informative Pamphlets

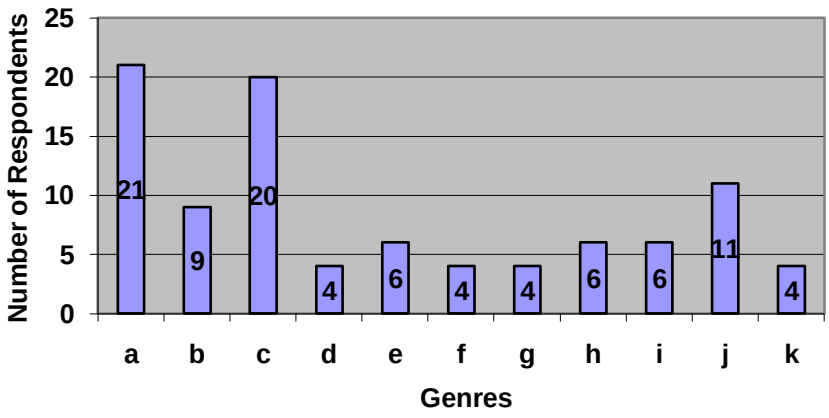
g) Speeches

h) Rules and regulations.

i) Promotional documents

j) Notes

k) Other genres: Technical documents, Contracts, Presentations




In this case, the term *forms of written communication* refers to genres employed by these engineers in the workplace, such as reports, forms, correspondence (memoranda, formal and informal letters, e-mail, etc.), notices and/or internal letters, work agendas, informative pamphlets, speeches, rules and regulations, promotional documents or notes. Subsequently, I verified that engineers are busy with clients/contacts, and therefore need to make use of

presentations, correspondence, notices, informative pamphlets, speeches, project proposals or promotional documents; and in addition, they also have to describe and solve technical problems by writing status reports, notes, informative pamphlets, and rules and regulations. They are also expected to write up these genres in both a formal and informal register: email messages, faxes, notes, reports and memoranda.

In figure number 15, engineers recognize the importance of writing skills in their work. I think they will agree with me when I assume that if you write well you are a better communicator and, therefore, a better worker. The value as an employee depends not only on their knowledge of engineering, but also on the ability to communicate information and ideas.

P. F. Drucker (1952) once stated:

> *If you work on a machine, your ability to express yourself will be of little importance. But the further away your job is from manual work, and the larger the organisation that you work for, the more important it is that you know how to convey your thoughts in writing and speaking. The ability to express yourself is perhaps the most important of all the skills that you can possess. (in Barrass, 1978: 8)*

Engineers must communicate with the people they work for, their colleagues inside and outside their organization, and as they become responsible leaders, they must convey a strong and clear message to their trainees. It is not enough to be intelligent or a brilliant engineer, you have to make yourself clear to other people, that is, you should accurately explain what you are doing, why you are doing it and with what result. (Barrass, 1978: 16-17)

First of all, when someone is writing a letter, instructions or a report they have to decide what they want or have to say. Then decide which form this communication should take and ask themselves: "what does the recipient/reader need to know if he/she has to understand the message?". Since the reader is not present, and in some cases may be unknown to the writer in question, the writer has to ensure that the content of what is written is understood without any further help. This is the reason for the involvedness one must have with writing. Documents are written for various reasons, and a demarcation of these reasons is an essential part of writing strategy.

As Widdowson(1979: 176) once stated:

> *As I write, I make judgements about the reader's possible reactions, anticipate any difficulties that I think he might have in understanding and following my directions…*

Whatever the form of writing expected from professors, engineering students or professionals, the process will usually involve the following steps:

1. Gathering information from various sources;
2. Organising this information so that it appropriately answers the needs of the task that the writer has to complete;
3. Planning the text;
4. Drafting and redrafting the text to transfer the information and ideas fully and clearly.

Writers will also have to know how to compare and contrast certain facts, introduce the following topic, offer a supporting idea, or refer to previously presented facts. Essentially, this requires language techniques to connect the ideas logically and effectively. Engineers should write in Standard English and should avoid Colloquial English. They should also avoid idiomatic expressions, in which the words have a special meaning that may be misunderstood out of context. They should find out as much as they can about the readers, and then match the vocabulary and style of writing to their needs. Some readers may be experts in the same field, others may be engineers with different specialisms and interests, and others may know nothing about telecommunications, but they all may be concerned in decision- making and in the possible applications of their work.

The following professional and academic genres are universally conventionalized and are usually "concerned only with the presentation of facts, hypotheses, and similar types of information" (Dudley- Evans & St. John 1998: 22). Writing in the area of technology is more constrained to academic discourse conventions and expectations of the readership. I will now define in context the different genres referred to in figure 15:

**a) Note-taking**

Writing is an activity that helps organize the ideas and preserve them for later consideration. As an example, note-taking at a meeting, presentation or when following instructions are used as an aid to later remember what to do or how to do something. Note-taking contains a three-part process:

1. the listeners or readers must comprehend the message they are receiving.

2. the listeners or readers choose what they think is relevant for the purpose, reject unnecessary material and write down the content of the message in the form of notes.

3. the notes are used for a purpose.

**b) Reports**

> *The writers have to ask themselves about the expectations of the readers, i.e. the discourse community. Writers need to ask themselves questions such as whether to expand a point, provide an example or define a term in order to help the reader understand the text or convince them of the legitimacy of the arguments presented. (Dudley-Evans & St. John, 1998: 115)*

I believe Dudley-Evans and St. John were specifically referring to writing reports for engineers more than to general technical writing because the stages they described refer to report writing, and most technical writing today involves the writing up of reports. A report is a systematic, accurate, concise, clear and well-structured document, as well as a major part of the progress and purpose of technology. The purpose of the report is to share information, as well as a basis for decision-making in telecommunications and in other sectors, such as industry, commerce and public services. They present the results of the research, study or analysis, and transmit a solution to a particular problem. This *genre* is shared by co-workers, workers from different companies, managers and clients. Reports are needed to implement and evaluate what has been worked on or developed, for example, if an engineer spends a year developing a new type of next generation mobile phone,

several types of reports are needed for the viability of design, costs, and work objectives. (Budinski, 2001: 1)

Michael Hoey (2001) and E. O. Winter (1976) believe that the organisational structure of these genres is divided into four stages: situation, problem, solution and evaluation. Among common types of reports that an engineer may encounter are the reading report, periodic report, progress report, the field report, and the research report. (Laster & Pickett, 1985: 305-315)

Reports are written genres, or even orally delivered, that record information for future reference, and ensure an accurate and efficient means of transmitting the information to different sources. A report may come in the following formats:

a) conventional report format: printed form, a memorandum, or a letter;

b) oral report.

There are formal and non-formal reports, and the main differences are that the latter has a stylized format evolving from the nature of the report and the needs of the reader, it is detailed and long and intended for the readers outside the company, unlike the informal report.

The conventional report outline may be listed as follows:

1. Title
2. Background
3. Objectives
4. Techniques used
5. Results
6. Benefits or conclusions
7. Further information, references, acknowledgements, etc.

Additionally, by using a classification system in reports, engineers try to impose a certain order into their writing. More specifically, an engineer may request from a superior a list of equipment that must be used in a project in the area of network communications and, consequently, this situation needs to be analysed so that it can be put into a meaningful

order. This is designated as analysis through classification, which is a basic step in solving a problem.

Another aspect of technical and academic writing is data commentary. Data is statistical information that may be presented graphically in the form of tables or figures. It is used to support the information and ideas of the writer. Tables, schematic descriptions, illustrations, graphs, diagrams, photographs and drawings should be as clear and simple as possible. These figures should be summaries of the results presented, as aids to interpretation, or they should present a new idea, make comparisons or might facilitate, for example, a representation and analysis of telecommunications systems, such as wireless connections. The information represented in these different genres is useful because they include summaries of relevant facts. The reader should be able to look from the text to the figure, and as far as possible, the results should be presented and allowed to speak for themselves. Although the information contained in charts and diagrams is normally clear, it usually requires some written comment, but not all the information should be described. It is usual to introduce the information with a general comment and then describe or comment on the most significant or important information.

**c) Presentations**

The success of the presentation hangs on the audience's understanding of the content, which is normally business or technical information. Presentation slides can increase the amount of information that the audience understands and, therefore, complement written documents. In fact, in many companies, engineers prefer to first make an oral presentation on a certain subject and then distribute the written report to those who would like to read its details. An engineer should plan slides that can be quickly read, have a reasonable amount of information and a clear order of information. Presentations should appear to be spontaneous in contrast to written documents, since the work can come alive for the audience through expressive presentation, the presenter can read the audience and react, or receive instant reaction.

**d) Protocols**

In computing, a protocol is a convention or a standard that controls or enables the connection, communication, and data transfer between two computing endpoints. In its simplest form, a protocol can be defined as the rules governing the syntax, semantics, and synchronization of communication. In the field of telecommunications, a communications protocol is the set of standard rules for data representation, signalling, authentication and error detection required to send information over a communications channel.

Protocols insure that the reader has both a clear idea of how they will do the experiment and that they have all the materials that are needed. The different parts of a protocol can be:

1. Purpose
2. Materials
3. Methods
4. Controls
5. Data Interpretation
6. References

When all of these components are set together, the engineer is able to write a scientific paper. The reader of a protocol is interested in being informed concisely and accurately, although legislative writing is also another linguistic characteristic of the protocol, as well as an enormous variety of linguistic devices to express qualifications and specifications.

**Correspondence**

Being able to write effective correspondence is one of the major writing skills that any employee needs, as one of the respondents; the Information Systems Negotiator (203) explained:

> *"O desempenho de um colaborador está, obviamente, relacionado com a forma como se relaciona e como comunica, seja na língua nativa ou em Inglês..."*

Engineers need to handle the aspects of work that involve correspondence, such as communicating with co-workers, making enquiries and replying about processes and equipment, requesting specifications, making purchases, answering complaints, and promoting products.

**e) Letters and Memoranda**

Letters are usually destined for organizations outside the company and so they must reflect, in both style and content, the general image of the organization. Before writing a letter, the ideas should be written down or organized in the mind so that they can be presented clearly and naturally. Moreover, writers need to be familiar with appropriate politeness strategies in making requests, complaints and conducting business activities in general. Letters are used when communicating with other organizations by post or facsimile or, sometimes, for internal communications. The letter of inquiry, order letter, sales letter, claim and adjustment letters, a letter of application, or transmittal letter are many types of letters used by engineers.

Memoranda are used to convey information or to confirm arrangements made on the telephone – bookings, train times, meeting details, and so on. They are a type of communication typically used between people in the same company and they serve as written records for the transfer of documents, instructions, meetings, etc. Memoranda give short, impersonal, direct, and simple information, suggestions or recommendations, as well as require action. Memoranda take the place of letters within any department or organisation. Companies end up creating their own style of memoranda and newcomers to a business must pick up the singularities of its discourse as quickly as possible.

**f) Email**

> *Modern technology is changing the format of written correspondence. There are standard correspondence, individualised letters, faxed letters and e-mail; we also have order forms and invoices. These types of text have moved away from the formal impersonal written communication. Clearly, they should maintain a good level of written communication, such as a clear purpose and organization, but format and language can be more informal and personal. (Dudley-Evans & St. John, 1998: 64)*

Email is the most popular means of communication today and, like a formal letter, it should be concise and to the point. In the world of business, education, politics and technology, electronic mail has taken the place of voice, paper and fax communication. An email can adopt many shapes and registers, since it can be a mere joke or a formal letter. With the email, engineers tend to focus most entirely on the message itself and less on the form, grammar, spelling, etc. They should also bear in mind that the email should not contain confidential or sensitive information, since it is a permanent record and can be forwarded to others or intercepted on the way. One can respond immediately and spontaneously without time for reflection, but it does not have the advantages of a face-to-face conversation, such as facial expressions and body language. Therefore, more care is needed online than in face-to-face discussions – this is referred to as *netiquette*.

Unlike letters and memoranda, emails can be an easy way of keeping business records which show to whom messages have been written and why, without the cumbersome recourse to a filing system. Now it is very practical and easy to save and store copies of correspondence.

Finally, I have reached the contexts of reading and understanding, which refer to genres required by these engineers in the workplace, such as correspondence (memoranda, formal and informal letters, e-mails, faxes, etc.), instruction manuals, machine warnings, catalogues, scientific bibliography (books, articles, catalogues, magazines, etc.) software manuals, protocols, Internet sites, work agenda, contracts, notices or/and circular letters, labels, agendas or proposals (see figure 16).

## Figure 16 – Genres which require Reading and Understanding skills

**Explanatory Caption – Qualitative variables referred to in figure 16**

a) Correspondence (formal and informal letters, e-mails, etc.)

b) Instruction manuals

c) Machine warnings

d) Catalogues

e) Scientific Bibliography (books, articles, catalogues, magazines, etc.)

f) Software manuals

g) Protocols

h) Internet Sites

i) Work Agenda

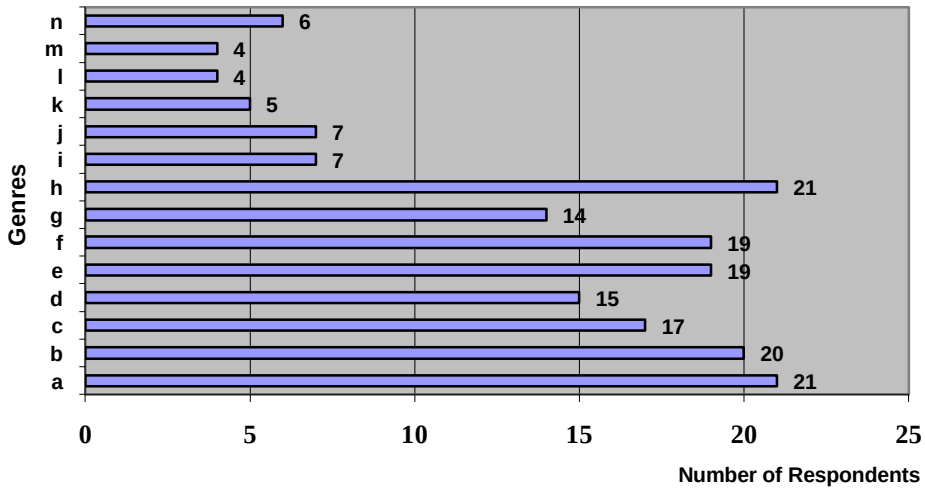
j) Contracts

k) Notices or/and Circular letters

l) Labels

m) Agendas

n) Other genres: Supplier proposals (2)



Predictably, correspondence, instruction (operating) manuals, software manuals, scientific bibliography and Internet sites are the most frequent reading and understanding genres made use of in a working environment. I noticed that this figure is the most heterogeneous, since about nine genres are used by seven engineers, at least. It is needless to say how very important reading is for these engineers, but I think the Director of Information Systems Negotiating at *PT Compras* (204) summarized it in the clearest way, when asked about the importance of English in his area of expertise:

> *"Nas áreas técnicas, o Inglês é indispensável aos engenheiros do ponto de vista de pesquisa e leituras técnicas, pois toda a documentação é escrita em Inglês. Nas áreas de gestão, o Inglês é essencial para comunicação (falado e escrito), além do já referido. O Inglês não só potencia o desempenho como é já obrigatório para o desempenho das funções de engenheiro."*

I will now characterise the required competences and skills that are usually used by the engineers in order to justify their paramount importance in the engineers' daily routines. The following figure shows the different skills and competences required in a global professional market, especially in the area of engineering, where I verified reading and understanding is the key to an engineer's success.

## Figure 17 – Required Competences and Skills in a working environment

**Explanatory Caption – Qualitative variables referred to figure 17**

a) Reading and understanding scientific documentation

b) Reading and understanding software and IT manuals

c) Reading and understanding machine instructions

d) Participating in meetings or (video) conferences

e) Socialising with people of different cultures

f) Understanding and using the grammar

g) Speaking about the company you work for

h) Giving information over the telephone

i) Writing administrative texts

j) Understanding and using the technical terms in the area of Telecommunications

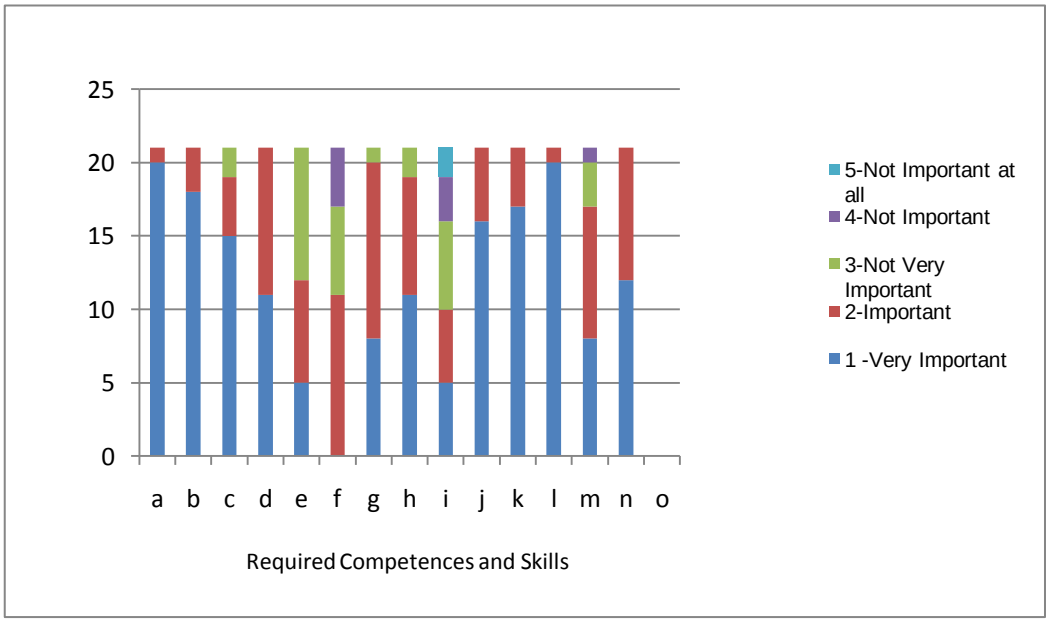
k) Understanding oral instructions

l) Understanding written instructions

m) Providing spoken and written information on operating machines

n) Searching for specialized sources of information on the Internet

o) Other skills and competences



As I moved from the written genres to the reading ones, I verified how and to what extent the reading and writing skills are essential to employees, in general, and engineers, in particular, because they are in fact very intertwined in terms of context and structure of the genres. I believe that at this stage, engineers will find writing to be their most crucial skill, because it is so difficult to grasp, but on the other hand, reading is the basis to everything they do, think and, eventually write.

> *Understanding a written text, whether in one's mother tongue or in a second language, is clearly a highly complex process. (Levenston et al. cited in Pugh & Uljin (ed.), 1984: 202)*

There are different components concerning reading understanding, such as recognizing the key words, understanding the inter-sentence relationships, knowing the function of the grammar structures, and identifying the tone of the text. Reading strategies vary from skimming a text to get the general idea, scanning a text for a specific piece of information, skipping unknown words, making predictions, confirming inferences, identifying the main idea, or rereading, to strategies such as activating prior background knowledge and recognizing text structure.

All these strategies involve ability to deduce the meaning of unfamiliar words and word groups, relations within the sentence, inexplicitly stated information and conceptual meaning. They also include understanding the relationship in the text structure and parts of a text through lexical-grammatical cohesion devices and indicators in discourse, distinguishing facts from opinions.

One of the most important contributions to the approach of reading in ESP was the shift from Text As a Linguistic Object (TALO) to Text As a Vehicle of Information (TAVI)[3] (Johns & Davies, 1983). Of course, for ESP learners and users, extracting information accurately and quickly from a text is more significant than other language details and applying this information is the most important. Knowing what engineers really do with a text, and why it is necessary to set the task that will guide the reading process and determine all the other activities is very important. For example, engineers may carry out

[3] Johns & Davies (1983) in Dudley- Evans & St. John (1998) *Developments in ESP: A Multi-disciplinary Approach.* Cambridge: Cambridge University Press, p. 96

an action while reading, such as when following instructions, or may have to write a response or make a telephone call.

a) **Scientific Bibliography**

I verified in question number six of sector B of the questionnaire, which referred to required competences and skills in a working environment (see figure 17), that reading and understanding scientific texts are a crucial part of the engineers' tasks and responsibility, since twenty of those polled consider this context very important.

Scientific bibliography comes in the form of books, research articles or magazines and its tone is essentially informative, such as the description of methods and results, and persuasive, such as the interpretation of results and the critical analysis of the work of others. I have written that the conventions of scientific writing demand that authors objectively report what was done and what was found, without adding personal interpretation. Consequently, scientific language should be clear, simple, complete, impartial, organized, accurate and objective.

Technical terms play an essential part in the narrative of science, since they contribute to an economy of words, and they should also form part of the common language used by engineers everywhere.

> *It is the responsibility of the ESP teacher to teach technical vocabulary, in certain specific contexts it may be the duty of the ESP teacher to check that the learners have understood the technical vocabulary appearing as a 'carrier content' for an exercise. (Dudley – Evans & St. John, 1998: 81)*

Dudley-Evans defined two broad areas in technical vocabulary: vocabulary that is used in general language but has a higher frequency of occurrence in scientific and technical description and discussion; and vocabulary that has specialised and restricted meanings in certain areas and which may vary in meaning across areas (Dudley Evans & St. John, 1998: 82).

Obviously, using the technical terms in the area of Telecommunications with confidence is of extreme importance to engineers. Figure number 17 illustrates that sixteen of the

engineers polled believe that "using and understanding technical terms in the area of Telecommunications" is very important, while five respondents found it to be important.

A Telecommunications engineer (203) from the company HFA affirmed when asked about the importance of ESP in the area of telecommunications:

> *"Sem dúvida, hoje e cada vez mais, a literatura disponível para as áreas da tecnologia, telecomunicações incluídas, é baseada na língua inglesa. Torna-se cada vez mais difícil encontrar informação transcrita em português logo é fundamental ter um bom domínio da língua inglesa bem como dos termos técnicos associados à nossa área de interesse."*

**a) Proposals**

A proposal is the main weapon in a negotiation, as it is a document in which you offer to do some work or provide a product at a specified price for a specific customer. This is exactly what occurs with the respondents who work at *PT Compras*, for example. The reader of a (supplier) proposal will have to search for the following information in a proposal:

- What the qualities of the supplier are;
- How the supplier can solve problems or adapt to the client's needs;
- What differentiates a supplier from other competitors;
- What the costs of the service are;
- What is not included in the proposal;
- What the after –sale arrangements are: training, maintenance, parts and service;
- What the technical details and specifications are.

In corporate culture, proposals should be short because they are easier to read, and therefore seen as more productive and profitable. The short proposal, due to its format and language, facilitates quick and efficient understanding by all organizations in order to reach a satisfactory agreement.

**b) Manuals**

Manuals of any type (software, instructions or information technology) communicate engineers' intentions or the operation of a process. They must be accurate, detailed and logical, since it is the organization, content, appearance and language that make an effective manual. Therefore, outside the discourse community, terms must be as simple as possible and consistent, that is, the reader should not find a number of different terms to define the same concept.

In Telecommunications, as in other scientific areas, many words have precise and specific meanings and so there is a rising need for defining a term. Engineers must be able to give clear and accurate definitions that are appropriate for the situation, they must know how and when to write a sentence definition or a lengthy definition, and they must know how to do this for a particular purpose and according to the knowledge level of the readership. A writer or a speaker should define a term that is unfamiliar to the audience, has multiple meanings, or is used in a special way in a presentation, for example.

Figure number 17 illustrates the significance of reading and understanding software and IT manuals for engineers. The majority find these manuals to be a priority in their field. In relation to machine instructions and instruction manuals, the answers prove that these are also an essential part of the engineers' daily routine, except for two engineers who work in sales and negotiation. I confirmed that reading instructions is a very important element in engineering success.

Clear, accurate, complete instructions save the reader or listener time, help them do a job faster and more satisfactorily, or help get better service from a product. Instructions that can be followed do not have unexplained gaps in the procedure or vagueness about what to do next. Being able to give and to follow instructions is essential for any employee. Certainly, in order for workers to advance to supervisory positions, they must be able to give intelligent, authoritative, specific, accurate instructions; and they must be able to follow the instructions of their superiors. Engineers will have to receive and give operational instructions (Laster, 1985: 15), which explain how to carry out a procedure or an operation, for example giving instructions on the operating of a machine. Giving instructions requires thought and careful planning, because it will be done in a foreign

language, it is crucial for the operation of a machine or the organization of a project, and the intended audience can be an experienced engineer or a student engineer. Therefore, the intended audience once again influences what information is to be presented and how it is to be presented, it is essential to know who will be reading or listening to the explanation and why. The engineers must be fully aware of what particular background, specialized knowledge, or certain skills are needed in order to understand the explanation.

Unlike written instructions, spoken instructions do not have to worry about spelling and punctuation, and there is the advantage of a visible audience with whom one can interact. Describing a process is also very much like giving instructions, however, the purpose is to describe a method or an operation so that the intended audience will understand what is done. An engineer constantly works with mechanisms or projects and always needs to understand them or describe them: what they do, what they look like, what parts they have, and how these parts work together, be it when writing a project report, a memorandum for a repairperson or purchase requests.

**c) Internet Sources**

> *The former US Vice-President, Al Gore told the following story on returning from one of his foreign trips: 'Last month, when I was in Central Asia, the President of Kyrgyzstan told me his eight-year-old son came to him and said, "Father, I have to learn English." "But why?" President Akayev asked. "Because, father, the Computer speaks English!" (Lockard, 1996: 4)*

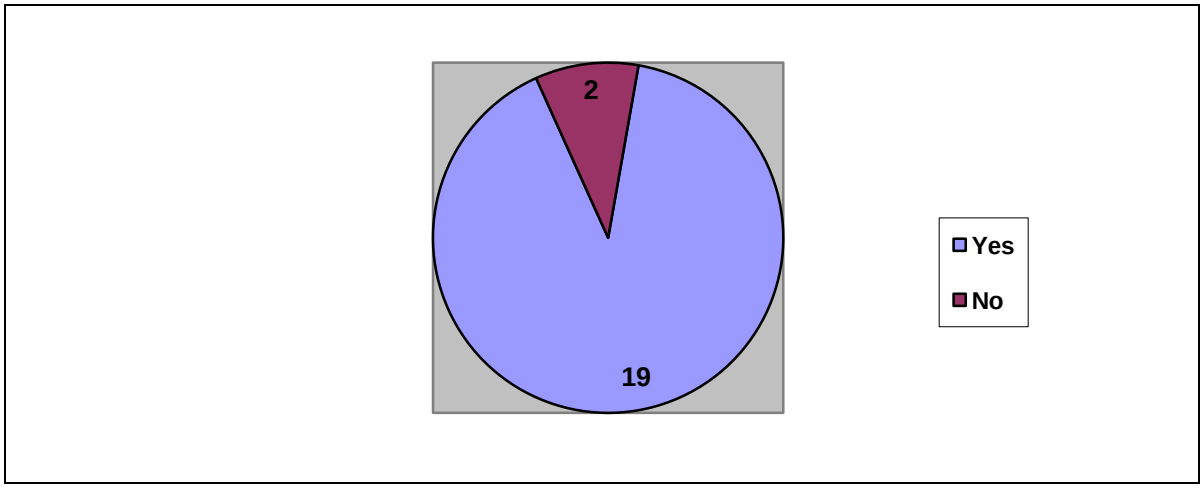
The global expansion of English into cyberspace is owed to the fact that the Internet is effectively an American creation and that computers are, in general, English-oriented. Netscape and Java are in English, the vocabulary of computing is mostly English, and most of the texts and search engines that are accessed through the Internet are in English. Approximately 80 percent of the contents of the 1 billion Internet pages on the net are in English (Austermühl, 2001: 2), as 90% of the Internet hosts are based in English-speaking countries.

In addition, English is the dominant language in international politics, business, technology, science, education, aviation, etc. It has been the *lingua franca* of global market economy, especially in the field of business and negotiations communication.

## C. General Considerations

In general, I come to the understanding that every engineer thinks English for Specific Purposes is very important in their field of work, as English is the language used for international information and research. Engineers work within and without the same organisation, and managers strive in unison to realize mutual goals. Lines of communication must therefore be maintained to facilitate these joint efforts. Without communication, the chances of a satisfying result of any business venture are significantly reduced. The communication interest in the workplace lies in how well individuals demonstrate the competencies and skills necessary for the industrial/business community. Figure 18 illustrates how ESP is essential to engineers in practice.

**Figure 18 – Importance of ESP in a work context**




These engineers justified their answers by acknowledging that English is the most spoken language in the business world and it has a crucial role in the understanding between people from different nationalities. They also confirm that most of the bibliography in this area is in English, so it is essential for any engineer working in the area of telecommunications.

If I carried out a careful analysis of job advertisements aimed at engineers, I would most certainly verify that they need to possess both technical as well as non-technical skills in order to climb up the ladder of success in their career. Communication skills,

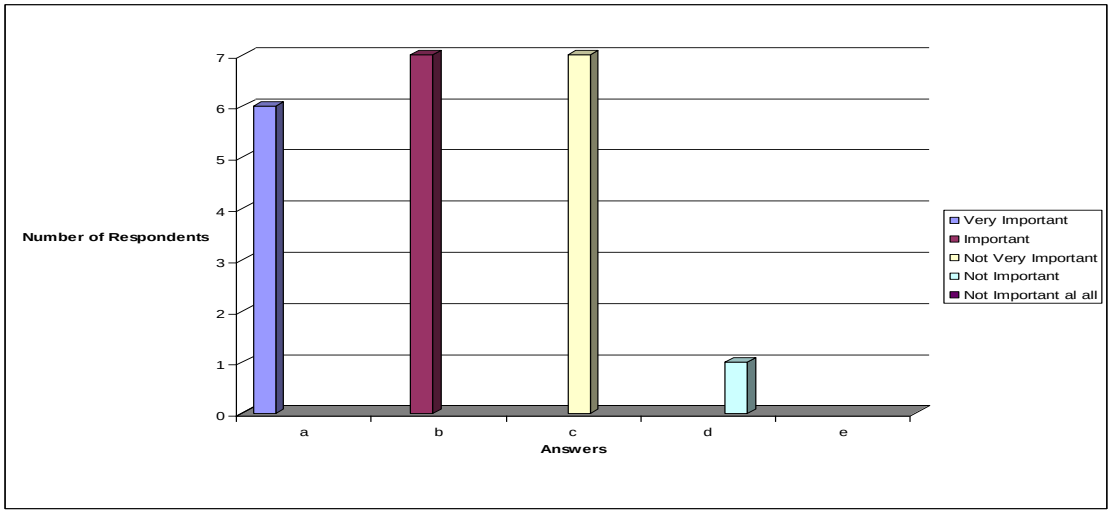
especially English language skills, should be given the significance they deserve, since these engineers are integrated in a multilingual society (The European Union, for example) where speaking at least one foreign language, preferably two, is considered the required norm. When asked, "do you think English is important for the placement of future engineers in the workplace?", 12 of the respondents found it to be very important, while nine thought it was important. Overall, a Network Services Support engineer from Ericsson respondent number (208) believes that:

> *"O desempenho de um colaborador está, obviamente, relacionado com a forma como se relaciona e como comunica, seja na língua nativa ou em Inglês…"*

I believe that the competitive strategies of these Telecommunications companies in Portugal are being and will be increasingly affected by the creation of new industries and the restructuring of existing industries, and will focus on gaining competitive advantage through workers with a multilingual profile. However, language and communication skills are not seen as essential attributes for the evaluation of engineers in practice. They are not directly evaluated on these language skills, but I have proved that they are undeniably important in their day – to – day performance, as reading and writing well in English are valuable assets for successful engineers. I think that if they master these communication skills, it will be easy for them to perform their technical tasks productively. Figure 19 illustrates the respondents' opinion on the importance of English for the evaluation of engineers. There are four different opinions but most of the engineers agree with the IT Analyst at Vodafone (206), when he stated:

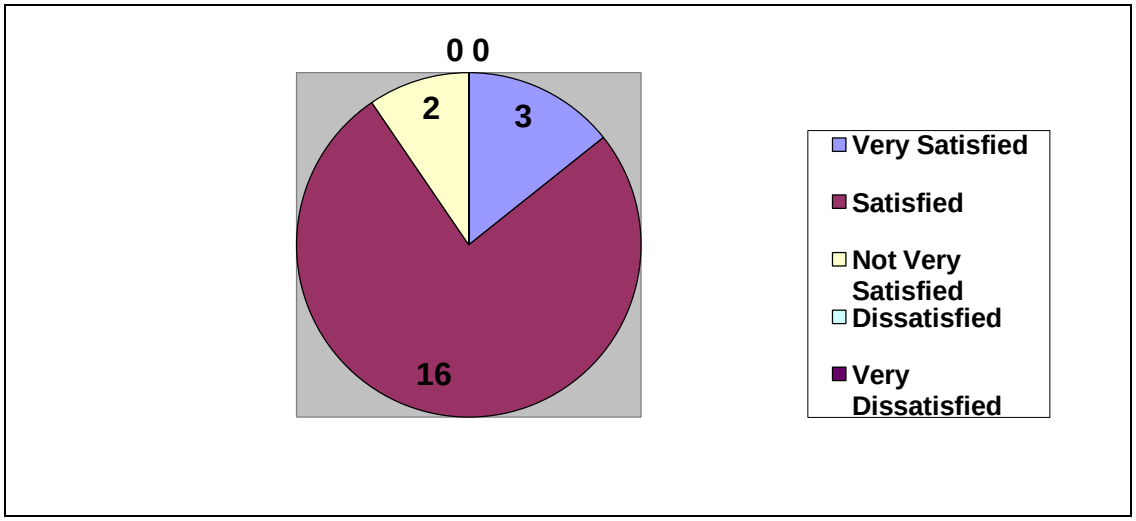
> *"Sendo o Inglês uma língua bastante implantada nas áreas técnicas, quanto melhor for o seu domínio, melhor poderá ser o desempenho de um trabalhador, já que quase toda a especificação técnica do que quer que seja está em Inglês."*

**Figure 19– Importance of English in the evaluation of Engineers**




When analysing the answers given to the following question (figure 20), in which I asked engineers to state their satisfaction with their level of English I verified that, even though they are frequently in touch with the language, only three of those polled are very satisfied with their English level. Sixteen respondents say they are satisfied with their level, and the remaining two admit to be not very satisfied with their English level. I believe that these results are linked to the fact that their schooling occurred after the 25th April revolution in Portugal, when English language learning was completely different, as was mentioned in section 3.1.4.

**Figure 20 – Engineers' opinion on level of English**



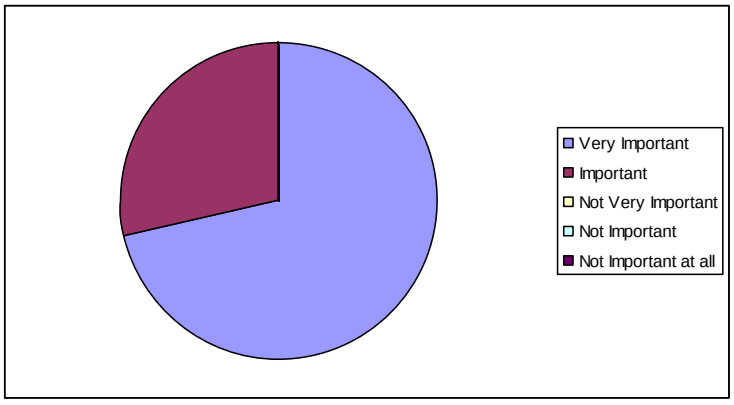
### 3.3.3. Analysis of the results obtained for Professors

My last set of questionnaires was handed out to the professors of the course of Electronics and Telecommunications at the University of Aveiro. As I have mentioned in my introduction, I am aware of my sample's constraints, since this section is only based on seven of the sixty questionnaires I distributed. Consequently, I will be careful, when generalising about the whole community.

Regarding figure number 21, professors were posed the question about the importance of the English language for students of the course in Electronics Engineering and Telecommunications. Five of the respondents thought it was very important, while two respondents found it to be important. Most of the professors believe that English is important due to the bibliography that students have to deal with in their academic lives. As respondent number 011 claimed,

> *"(O Inglês) é absolutamente essencial para a profissão – é uma espécie de "latim moderno", que mais ou menos adulterado, é compreendido no contexto da profissão, de forma quase universal."*

**Figure 21 – The importance of English in Students' university education**




Concerning figure number 21, when posed the question related to the importance of English for Specific Purposes (ESP) in students' performance during their academic lives, five professors believe that ESP is very important, because of the reason discussed in

figure number 21. Two respondents see ESP as an important aspect of students' academic path, but consider General English (GE) more useful at this point in their careers, as respondent number 016 stated that,

> *"O Inglês geral é importante, mas não o específico, pois não é muito complicado (para uma pessoa) integrar-se na linguagem específica da área, logo que se tenha bons conhecimentos gerais da língua inglesa."*

In terms of vocabulary, another respondent states that technical terms are very easy to understand and memorize, and does not advocate any use for ESP in students' academic curriculum. Respondent number 011 asserted that, even students who do not understand General English, can understand the terms easily. As the development of this study has shown, ESP is not limited to the understanding of technical terms, and it is indeed a language teaching made up of students' needs and communicative contexts. Perceiving it only in terms of vocabulary usage is very limiting, as well as understanding it in comparison to General English.

> *English for Specific Purposes (ESP) has for about 30 years been a separate branch of English Language Teaching. It has developed its own approaches, materials and methodology and is generally seen as very active, even 'feisty' movement that has had considerable influence over the more general activities of TESOL and applied linguistics. (Carter & Nunan, 2001: 130)*

This somewhat limited view of ESP on the part of teachers gives an indication of how they might have a slightly distorted understanding of the discourse needs of working engineers. They seem to accept the need their students have for academic English; they themselves probably feel this need too but have a somewhat simplistic view of both ESP and of communication needs in the workplace.

**Figure 22 – The importance of ESP in Students' performance**

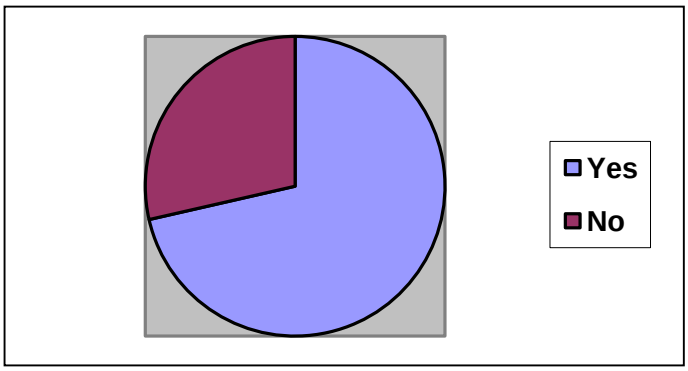
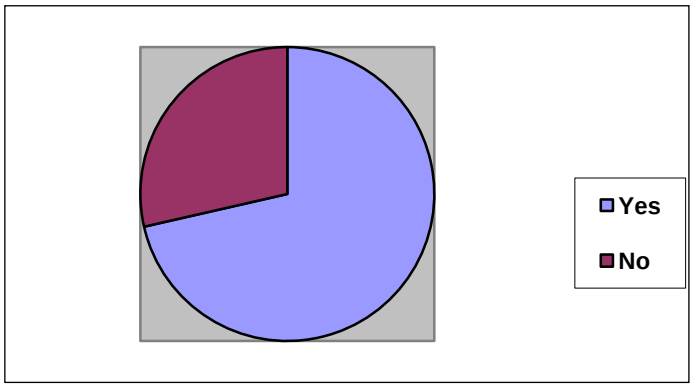


Figure number 23 illustrates the importance of ESP in engineers' professional performance and the answers and justifications were the same as the ones referred in the previous figure.

**Figure 23 – The importance of ESP in Engineers' performance**




The following question refers to the different communicative contexts which professors have to face in their professional lives. I noticed that these were not very different from the students' answers in the section related to students' questionnaires.

Reading and understanding has been the recurrent answer in these questionnaires. This skill is without a doubt the most essential in any professional context, be it in the workplace or in academia. Additionally, the fact that these professionals are dealing with technology development, which is in constant mutation, makes it crucial for them to be informed and, therefore, turn to technical bibliography. The genres that professors seek are: encyclopaedias, handbooks, directories, literature reviews, review articles or research articles, specialist journals, abstracting journals, dissertations, thesis and reports, etc.

On the other hand, speaking skills are often required in conferences, lectures, or seminars. As university professors, they may at some point be requested to present or coordinate conferences in the technical field. The conference is an opportunity to describe their research or end product, as well as make a great impression on colleagues, employers and potential employers. In this context, professors have to highlight their communication skills and their presentation skills. In addition, professors will not only have to test their speaking skills, but also their reading skills, since visuals are used in a conference, such as handouts, board displays, (PowerPoint) slides, or over-head projector transparencies. The following figure refers to the communicative contexts used by the university professors:

## Figure 24 – Communicative contexts for Professors

**Explanatory Caption – Qualitative variables referred to in figure 24**

a) Teaching

b) Reading and Understanding technical documentation

c) Reading and Understanding software manuals

d) Reading and Understanding machine instructions

e) Participating in (video) conferences

f) Socialising with people from different cultures

g) Giving information over the telephone

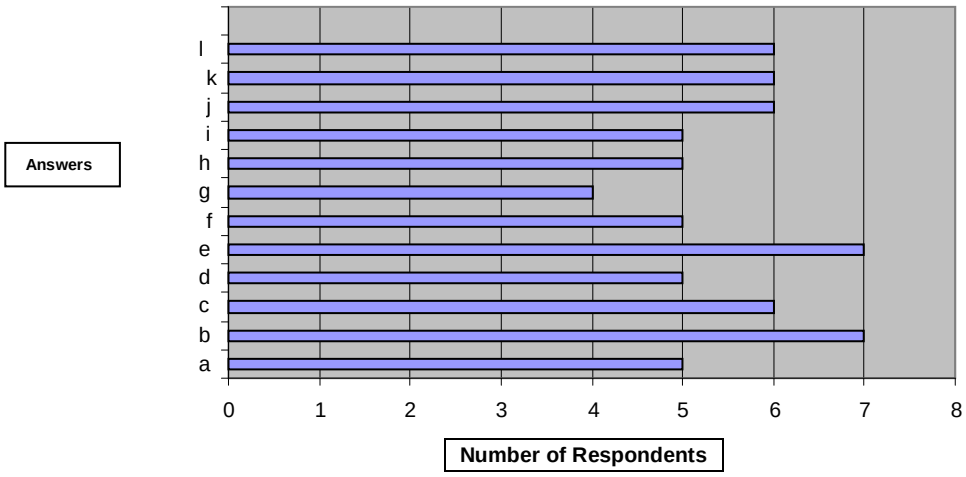
h) Using of technical terms in the area of Telecommunications

i) Understanding oral instructions

j) Understanding written instructions

k) Writing scientific documents (articles, papers, reports, etc.) .

l) Other contexts




My last question referred to the degree of confidence with which each professor communicates in English in their professional lives. The communicative context, writing scientific texts, is achieved with total confidence by three respondents. This is not

surprising, since this communicative context is commonly used by professors to show the scientific community the results of their work.

This question was posed to demonstrate that, due to their academic and cultural level, professors know General English and English for Specific Purposes considerably more than their students. I verified this because at least half of the respondents feel totally confident or very confident when dealing with these different contexts, for example using technical terms in the area of Telecommunications (see figure 25).

## Figure 25 – Confidence demonstrated in using the English language

**Explanatory Caption – Qualitative variables referred to in figure 25**

a) Telephone conversation

b) Participating in meetings

c) Participating in (video) conferences

d) Solving technical problems

e) Teaching at a foreign university

f) Giving technical instructions about machines

g) Participating in the solution of interpersonal problems

h) Writing scientific documentation (articles, papers, reports, etc.)

i) Filling out forms to request new equipment

j) Correspondence (e-mails, formal and informal letters)

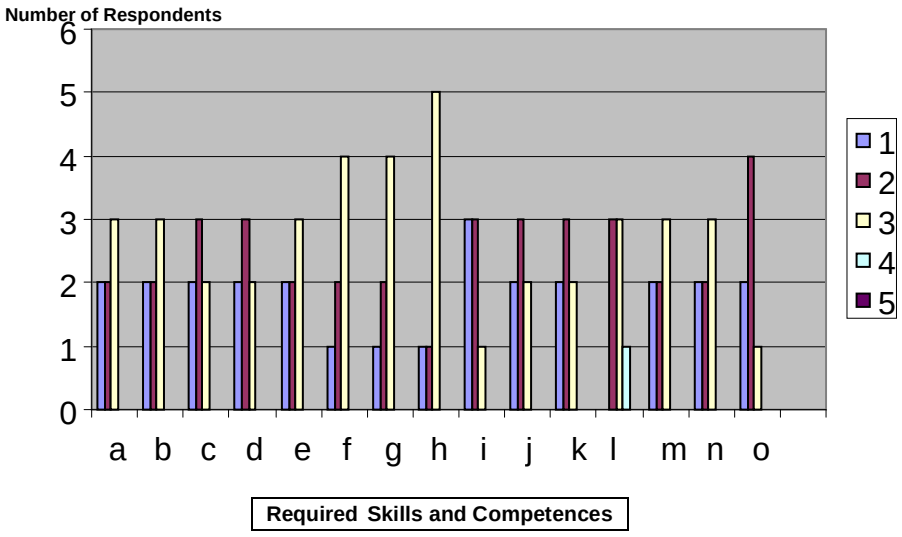
k) Socialising with people from different cultures

l) Contacting the international academic community

m) Giving information over the telephone

n) Using technical terms in the area of Telecommunications

o) Other skills and competences




***1=total confidence; 2= a lot of confidence; 3=with confidence; 4=little confidence; 5=no confidence at all***

After having been through this process of Needs Analysis, I verified that I could have asked more questions related to the language policies used inside the Telecommunications companies and the implications that this might have on the workers' performance. Regarding this issue, it would be interesting to know in which language they communicate internally, amongst the various branches of these multinational companies and externally with central directorship, clients, policy makers, and suppliers in various countries. It would also be interesting to know how terminology is harmonized and what policies are adopted to reach this end.

Nevertheless, I obtained important data regarding the professional and academic community's learning needs. This information could be used as a future aid for ESP teachers when designing a syllabus and organizing the appropriate material. In other words, this information is an asset not only for teachers who will prepare better communicators and, therefore, better professionals, but also for learners who will be able to use what they have learned at any moment in their professional lives, giving them confidence and knowledge to go ahead and beyond. After analyzing and comparing the results, I can now arrive at conclusions to answer my research questions which I will do in the following chapter.

# Chapter IV – Conclusions

"It is the time you have wasted for your rose that makes your rose so important."

*The Little Prince* - Antoine de Saint Exupéry

Like anyone who writes a dissertation, I thought I was going to find all the answers to the questions that I had in my mind at the beginning of my project, I also thought that I would answer some important questions that have mystified so many teachers of ESP who preceded me or are my contemporaries, and mainly, I believed that I would contribute significantly to the world of English language learning. At this stage, I admit that not all my questions have been answered and my contribution to the world of learning is indeed modest, but I have made a difference to the manner in which I perceive the needs and requirements of Electronics Engineering students and professionals.

This study makes the claim that language and communication skills, including English for Specific Purposes, are important elements in the education of the modern engineer, or student engineers of the course in Electronics Engineering and Telecommunications at the University of Aveiro. The English language has become a major medium for communication across borders globally. In this way, I feel that there should be English language courses offered at university level that should target skills related to professional needs and work functions, to ensure that the learners are well equipped with the required communicative skills in order for them to perform confidently in the workplaces.

Nevertheless, the needs analysis that was developed in this study shows a limited implementation of this type of English course at the University of Aveiro and a deficiency in this area can result in barriers for the personal and professional development of graduates and engineers. The discussion of needs analysis demonstrates a clear case regarding some deficiencies that should be corrected at university in Electronics programs

in order for students to have access to meaningful language preparation and training for their future professions.

This study has called into question the fact that education at the university is a crucial stage because, at this level, students are preparing themselves to enter into another phase of their lives, which is their career, and therefore, they have certain expectations of what they want to learn and achieve in their learning process. The need to develop communicative skills is crucial, due to the rapid change and development of the work market that requires graduates to acquire certain level of communicative and language skills. Globalisation has manifested itself in the increased use of English as the language of work world-wide and in a certain way, in the corresponding decrease in the use of other languages in foreign language acquisition.

Unfortunately, it is common knowledge that although students spend six to nine years studying English as a school subject, this is not always sufficient for them to achieve an intermediate level of proficiency in language. I deduce that students who are technically ready for work after finishing their university studies are not so well prepared to apply their evidently more specific knowledge of English in a work context, although the majority of the engineers questioned felt satisfied with their level of English. The results showed that students do not have enough specific and, in some cases, general knowledge of the language in order to achieve successful results in their course. On the other hand, and although English is a *global language* in technology, students only feel the need to read it proficiently or have good listening skills – due to the impact of the English language on the media and telecommunications industry. Speaking is a productive skill in the oral mode and it is the most difficult for learners since it is more than pronouncing words. It is the fastest passport to the complex process of communication and expression. This requires a great degree of fluency and thinking *on the spot*, and requires practice and exposure to the language over time, but it is a much neglected skill in the teaching of ESP.

An unexpected aspect in my research findings was the fact that there are still professors who believe that English for Specific Purposes is not an essential tool in their students' lives. Indeed, English can be seen as it is in this university context – an optional course (see appendix II) in the fifth year students' curriculum and just another class to attend. Nevertheless, I find it intelligent that this option is a part of the final year of the course, in

which students are already looking forward to future careers. It is significant that there is an optional English course available to any fifth year student, if they require it, but this course should be obligatory in the curriculum for every academic year: in the first years, to help them in acquiring skills for Academic Purposes, in the final years to develop the workplace components of ESP. Disappointingly, English is not even a part of the curriculum of the courses based on the *Bologna Process*. It is probably utopian, but I have repeatedly mentioned the growing significance that the English language has on our personal and professional lives and I think work interests would be furthered by a greater effort in this field. Unfortunately, in Portugal, this growing significance is still very small and trying to take form.

In chapter three, I chose to discuss my findings further, not only through Needs Analysis, but also through a Genre-Based study. This would help me to understand not only the needs of these students, engineers and professors, but also the genres and contexts that they should expect to face in their daily lives. The findings from this study clearly state that the subjects involved in the three sets of questionnaires: engineers, students and professors share specific needs and objectives or rather ambitions in learning in English. The needs to perform work-related tasks such as reading technical bibliography, searching Internet sites, writing reports or correspondence and socialising in English are among some of the most common communicative contexts. Here, it is clear that students and engineers need to master certain types of reading and writing skills in order to perform their duties in the workplace successfully. Therefore, many areas need to be looked into to balance ESP, EOP and General English language proficiency for students, for example, in order to ensure maximum effectiveness of the transition from learning to working. Apart from equipping the learners with the specific skills, my findings also support the need for EOP courses as the engineers become motivated when they do tasks related to their needs. Consequently, research in the area of reading and writing especially at tertiary level should be encouraged. The need to develop these skills is crucial due to the rapid change and competition of the academic and work framework that requires graduates to acquire a certain level of communicative skills.

Although these ideas seem to be part of ESL teachers' and learners' common sense, some of the questioned university professors deride the importance of English for Specific

Purposes in this area. Another reason to develop and discuss this project was the fact that I wanted to prove these theories wrong. This underestimation is due to the fact that many professors are unaware of what ESP is, and the difficulties of communication that are solved by language learning for specific purposes. This can be as much the fault of deficiently inquisitive electronics professors as a lack of promotional initiative on the part of ESP teachers.

I believe that for students in the first years of their learning programme, motivation for reading, for example, is linked to assignments or passing an exam. On the other hand, senior students usually practise their reading to build up terminology and content understanding. In order to teach students how to operate in an academic context, an English course should undoubtedly involve text. Students should know the language of English academic texts, and this, consecutively, will involve developing in them the 'Hallidayian' understanding of how academic texts function in society, how academic texts are produced, how academic discourse relates to the English language as a whole, and how the linguistic structures of academic discourse are specific. According to students, listening and understanding may pose the biggest problem. I believe that in some circumstances the reading ability in English may be the greatest difficulty and, of course, the biggest need. The most persistent problem for students is also the inability to express themselves confidently in spoken language, since there is so little opportunity to practise.

As engineers are required to communicate effectively in different situations, think creatively and critically, demonstrate good interpersonal and team skills, I believe that an ESP course in Telecommunications should be created based not only on the learners' needs, but also on the expectations of recruiters in the workplace. Engineers who communicate well in a foreign language advance easily in rank, eventually reaching executive levels. Technical communication is primarily based on information, but there are persuasive elements in almost all communication. The experience of practicing engineers bears out the correlation between communicative skills and successful careers. In this perspective, the priority of speaking skills and listening skills is once again evident, not only when holding a post, but even before getting the job, that is, during the recruitment and selection interviews. In other words, inefficient language skills may prove to be eliminatory for an unprepared potential candidate. In this sense, true communicative

competence makes future job seekers more marketable. This study makes the claim that effective oral communication skills in English, such as learning how to make an effective presentation, how to speak convincingly to others, how to take part in group discussions and how to ask the right questions correctly, are some of the most important speaking skills that are central to Telecommunications engineers in any workplace context. These skills can increase the chances of candidates' employability and enhance their work performance.

In this sense, I defend the idea of developing a practical and useful way of teaching ESP for Telecommunications that keeps preparation for the world of work in focus. On the same token, I am referring to a structured syllabus, which should be balanced and demanding, and needs to pay special attention to all four traditional skills, especially to the reading and writing skills. Unfortunately, traditional language classrooms do not particularly lend themselves to fluent and flexible communication between teachers and students and, consequently, those situations taking place within them cannot be considered comparable to the real world. In order for the teaching of ESP/EOP to cover the requirements of present day society, future professionals must be prepared to use English in the workplace adequately. The classroom and the outside world are too often considered two exclusive and excluding entities, each operating on its own. However, in an attempt to avoid this division, the design of an appropriate ESP/EOP syllabus can contemplate the classroom as a physical place and an integral part of the real world, only differing from the latter in a series of conventions, interrelations and strategies.

The learning process within many ESP environments is often dominated by the conflict, which arises when a comparison is made between what the learners aim to achieve from a given course with the methods used to achieve these aims. This study has attempted to identify some issues that will contribute to a future ESP course design and explain how involving the learners in the learning process can add positive learning experiences in an ESP/EOP course, as they bring rich work experiences which consequently become effective learning resources. By involving students in some elements of course design, ESP teachers can look forward to enhancing their students' English literacy development as an aid to developing success in their learning.

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# Appendices

## Appendix I

**Entrevista**

1. Qual é a sua formação académica?

2. Qual é sua formação a nível do Inglês?

3. Com que frequência utiliza a língua inglesa no contexto de trabalho?

4. Em que contextos utiliza a língua Inglesa?

5. Qual a competência linguística que mais utiliza?

6. Conhece o nível Inglês dos alunos de Engenharia Electrotécnica e Telecomunicações (EET)? Se sim, está satisfeito com o nível de Inglês dos alunos?

7. Considera que a aprendizagem do Inglês específico da área de Telecomunicações constitui uma componente importante na formação dos Engenheiros de Electrotecnia na área de Telecomunicações? Se sim ou se não? Porquê?

8. Considera que a aprendizagem da língua Inglesa constitui um contributo para a tecnologia e inovação? Porquê?

9. Mencione a seguir outras informações/ observações que gostaria de acrescentar relativamente à importância e uso do Inglês na formação dos alunos de EET da Univeridade de Aveiro.

# Appendix II

**Course Curriculum (2006/2007) *Pre- Bologna Process***

| *1º Ano* | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Área* | *Disciplinas* | *t/tp/p* | *u.c.* | *Área* | *Disciplinas* | *t/tp/p* | *u.c.* |
| *M* | *Cálculo I* | *2/3/0* | *4* | *M* | *Cálculo II* | *3/3/0* | *5* |
| *F* | *Elementos de Física* | *2/1/2* | *3.5* | *M* | *Tópicos de Matemática Discreta* | *2/0/2* | *3* |
| *M* | *ALGA* | *3/2/0* | *4.5* | *F* | *Mecânica* | *2/1/2* | *3.5* |
| *I/Ctp* | *Programação I* | *2/0/3* | *3* | *I/Ctp* | *Programação II* | *3/0/3* | *4* |
| *I/Ctp* | *Aplicacionais para Ciência e Engenharia* | *2/0/2* | *3* | | *Opção Livre* | | *1.5* |
| *2º Ano* | | | | | | | |
| *Área* | *Disciplinas* | *t/tp/p* | *u.c.* | *Área* | *Disciplinas* | *t/tp/p* | *u.c.* |
| *M* | *Cálculo III* | *3/2/0* | *4.5* | *F* | *Elem. de Física do Estado Sólido* | *2/1/2* | *3.5* |
| *F* | *Electromagnetismo* | *2/2/2* | *4* | *Ele/Elg* | *Análise de Circuitos* | *3/0/2* | *4* |
| *M* | *Métodos Numéricos* | *2/0/3* | *3* | *Ele/Aps* | *Métodos Prob. Eng. Elect e Comp* | *3/2/0* | *4.5* |
| *Ele/Aps* | *Introdução à Analise e Processamento de Sinal* | *3/1/2* | *4.5* | *I/Asc* | *Sistemas Digitais I* | *3/0/3* | *4* |
| *3º Ano* | | | | | | | |
| *Área* | *Disciplinas* | *t/tp/p* | *u.c.* | *Área* | *Disciplinas* | *t/tp/p* | *u.c.* |
| *Ele/Elt* | *Electrónica I* | *3/0/3* | *4* | *Ele/Elt* | *Electrónica II* | *3/0/3* | *4* |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Ele/Cont* | *Teoria de Sistemas* | *3/1/2* | *4.5* | *Ele/Tel* | *Propagação de Ondas Electro Mágneticas* | *3/0/3* | *4* |
| *Ele/Elg* | *Electrotecnia Teórica* | *2/0/2* | *3* | *Ele/Tel* | *Fund. Telecomunicações I* | *3/0/2* | *4* |
| *I/Asc* | *Arquitectura Computadores I* | *3/0/3* | *4* | *I/Asc* | *Interfaces e Periféricos* | *2/0/3* | *3* |

*4º Ano*

| *Área* | *Disciplinas* | *t/tp/p* | *u.c.* | *Área* | *Disciplinas* | *t/tp/p* | *u.c.* |
|---|---|---|---|---|---|---|---|
| *Ele/Elt* | *Electrónica III* | *3/0/2* | *4* | *Ele/Elt* | *Electrónica IV* | *3/0/3* | *4* |
| *I/Asc* | *Sistemas de Operação* | *2/0/2* | *3* | *Ele/Cont* | *Sistemas de Controlo* | *3/0/2* | *4* |
| *Ele/Aps* | *Processamento Digital de Sinal* | *3/0/2* | *4* | *Tel* | *Propagação e Radiação de Ondas Electromagnéticas* | *3/0/2* | *4* |
| *Ele/Elt* | *Electrónica de Potência* | *2/0/2* | *3* | *Tel* | *Sistemas de Telecomunicações* | *3/0/3* | *4* |
| *Ele/Tel* | *Fund. Telecomunicações II* | *2/0/2* | *3* | | | | |

*5º Ano*

| *Área* | *Disciplinas* | *t/tp/p* | *u.c.* | *Área* | *Disciplinas* | *t/tp/p* | *u.c.* |
|---|---|---|---|---|---|---|---|
| | *Opção I* | *3/0/0* | *3* | | *Opção V* | *3/0/0* | *3* |
| | *Opção II* | *3/0/0* | *3* | | *Projecto (anual)* | *0/0/19* | *12* |
| | *Opção III* | *3/0/0* | *3* | | | | |
| | *Opção IV* | *3/0/0* | *3* | | | | |
| | *Projecto (anual)* | *0/0/10* | *3* | | | | |

# Appendix III

## Course Curriculum (2008/2009)

| ***1º ano › 1º semestre*** | ***a.c.*** | ***t\|tp\|p*** | ***ects*** |
|---|---|---|---|
| *Análise Matemática I* | *M* | *0 \| 6 \| 0* | *8* |
| *Álgebra Linear* | *M* | *0 \| 5 \| 0* | *8* |
| *Programação I* | *I/Ctp* | *0 \| 2 \| 3* | *8* |
| *Técnicas Laboratoriais em Electrotecnia* | *ELE/Elg* | *0 \| 1 \| 3* | *6* |
| ***1º ano › 2º semestre*** | ***a.c.*** | ***t\|tp\|p*** | ***ects*** |
| *Sistemas Digitais* | *I/Asc* | *0 \| 2 \| 3* | *8* |
| *Programação II* | *I/Ctp* | *0 \| 2 \| 3* | *8* |
| *Mecânica e Oscilações* | *F* | *0 \| 3 \| 2* | *6* |
| *Análise Matemática II* | *M* | *0 \| 6 \| 0* | *8* |
| ***2º ano › 1º semestre*** | ***a.c.*** | ***t\|tp\|p*** | ***ects*** |
| *Análise Matemática III* | *M* | *0 \| 5 \| 0* | *8* |
| *Análise Numérica* | *M* | *0 \| 3 \| 2* | *8* |
| *Arquitectura de Computadores I* | *I/Asc* | *0 \| 3 \| 2* | *6* |
| *Campo Electromagnético* | *F* | *3 \| 0 \| 2* | *8* |
| ***2º ano › 2º semestre*** | ***a.c.*** | ***t\|tp\|p*** | ***ects*** |
| *Arquitectura de Computadores II* | *I/Asc* | *2 \| 0 \| 3* | *8* |
| *Análise de Circuitos* | *ELE/Elg* | *3 \| 0 \| 2* | *8* |
| *Introdução à Análise e Processamento de Sinal* | *ELE/Aps* | *3 \| 0 \| 2* | *6* |
| *Tópicos de Física do Estado Sólido* | *F* | *0 \| 3 \| 2* | *8* |
| ***3º ano › 1º semestre*** | ***a.c.*** | ***t\|tp\|p*** | ***ects*** |
| *Sistemas e Controlo I* | *ELE/Cont* | *3 \| 0 \| 2* | *8* |
| *Métodos Probabílisticos em Electrotecnia* | *ELE/Aps* | *3 \| 0 \| 2* | *8* |
| *Electrotecnia Teórica* | *ELE/Elg* | *2 \| 2 \| 2* | *6* |
| *Electrónica I* | *ELE/Elt* | *3 \| 0 \| 3* | *8* |
| ***3º ano › 2º semestre*** | ***a.c.*** | ***t\|tp\|p*** | ***ects*** |
| *Electrónica II* | *ELE/Elt* | *3 \| 0 \| 3* | *8* |
| *Sistemas de Comunicação I* | *ELE/Tel* | *3 \| 0 \| 2* | *8* |
| *Projecto em Engenharia Electrotécnica* | | *0 \| 2 \| 0* | *6* |
| *Propagação de Ondas Electromagnéticas* | *ELE/Tel* | *3 \| 0 \| 2* | *8* |
| ***4º ano › 1º semestre*** | ***a.c.*** | ***t\|tp\|p*** | ***ects*** |
| *Sistemas de Comunicação II* | *ELE/Tel* | *2 \| 0 \| 2* | *6* |
| *Processamento Digital de Sinal* | *ELE/Aps* | *2 \| 0 \| 2* | *6* |
| *Sistemas de Operação* | *I/Asc* | *2 \| 0 \| 2* | *6* |
| *Electrónica III* | *ELE/Elt* | *2 \| 0 \| 2* | *6* |

| | | | |
|---|---|---|---|
| *Electrónica de Potência* | *ELE/Elt* | *2 \| 0 \| 2* | *6* |
| ***4º ano › 2º semestre*** | ***a.c.*** | ***t\|tp\|p*** | ***ects*** |
| *Electrónica IV* | *ELE/Elt* | *3 \| 0 \| 3* | *8* |
| *Antenas e Guias de Onda* | *ELE/Tel* | *2 \| 2 \| 1* | *6* |
| *Sistemas de Controlo II* | *ELE/Cont* | *3 \| 0 \| 2* | *8* |
| *Redes de Telecomunicações* | *ELE/Tel* | *3 \| 0 \| 2* | *8* |
| ***5º ano › 1º semestre*** | ***a.c.*** | ***t\|tp\|p*** | ***ects*** |
| *Gestão de Projectos e Empreendedorismo* | *GES* | *0 \| 2 \| 2* | *8* |
| *Opção I* | | *0 \| 0 \| 0* | *6* |
| *Sistemas Digitais Reconfiguráveis* | *I/Asc* | *0 \| 3 \| 0* | *6* |
| *Sistemas de Tempo Real* | *I/Asc* | *0 \| 3 \| 0* | *6* |
| *Redes de Comunicação em Ambiente Industrial* | *ELE/Tel* | *2 \| 0 \| 2* | *6* |
| *Computação Móvel* | | *0 \| 3 \| 0* | *0* |
| *Modelação e Síntese de Processadores* | *I/Asc* | *0 \| 3 \| 0* | *6* |
| *Reconhecimento de Padrões* | | *0 \| 3 \| 0* | *6* |
| *Redes e Serviços em Imagiologia* | | *0 \| 3 \| 0* | *0* |
| *Redes Ópticas* | *ELE/Tel* | *0 \| 3 \| 0* | *6* |
| *Análise de Redes de Telecomunicações* | *ELE/Tel* | *0 \| 3 \| 0* | *6* |
| *Computação Gráfica* | *I/Ctp* | *0 \| 3 \| 0* | *6* |
| *Comunicações Ópticas* | *ELE/Tel* | *0 \| 3 \| 0* | *6* |
| *Comunicações sem Fios* | *ELE/Tel* | *2 \| 0 \| 1* | *3* |
| *Electrónica de baixa potência* | *ELE/Elt* | *0 \| 0 \| 0* | *0* |
| *Programação Orientada por Objectos* | *I/Ctp* | *0 \| 3 \| 0* | *6* |
| *Electrónica e Sistemas Médicos* | *ELE/Elt* | *1 \| 0 \| 2* | *0* |
| *Integração de Redes* | *ELE/Tel* | *0 \| 0 \| 0* | *0* |
| *Microelectrónica* | *ELE/Elt* | *0 \| 3 \| 0* | *6* |
| *Modelação e Concepção de Sistemas* | *I/Si* | *0 \| 0 \| 0* | *0* |
| *Planeamento de Comunicações Móveis* | *ELE/Tel* | *0 \| 3 \| 1* | *0* |
| *Sistemas de Comunicações sem Fios* | *ELE/Tel* | *0 \| 3 \| 1* | *0* |
| *Interfaces Humano-Computador* | *I/Si* | *2 \| 1 \| 0* | *3* |
| *Opção II* | | *0 \| 0 \| 0* | *6* |
| *Opção III* | | *0 \| 0 \| 0* | *6* |
| ***5º ano › anual*** | ***a.c.*** | ***t\|tp\|p*** | ***ects*** |
| *Dissertação* | | *0 \| 0 \| 0* | *34* |

# Appendix IV

The major fixed telephone operators of 2008 in Portugal are the following:

AR Telecom - *Acessos e Redes de Telecomunicações, S.A.*

CABO TV AÇOREANA, S.A.

CABO TV MADEIRENSE, S.A.

CABOVISÃO - *Sociedade de Televisão por Cabo, S.A.*

CATVP - *TV Cabo Portugal, S.A.*

COLT Telecom - *Serviços de Telecomunicações, Unipessoal, Lda.*

EQUANT PORTUGAL, S.A. (ORANGE)

G9SA - *Telecomunicações, S.A.*

ONITELECOM - *Infocomunicações, S.A.*

*PT Comunicações, S.A.*

PT Prime - *Soluções Empresariais Telecomunicações e Sistemas, S.A.*

RADIOMÓVEL - *Telecomunicações, S.A.*

REFER TELECOM - *Serviços de Telecomunicações, S.A.*

SONAECOM - *Serviços de Comunicações, S.A.*

TeleMilénio - *Telecomunicações, Sociedade Unipessoal, Lda. (TELE 2)*

TMN - *Telecomunicações Móveis Nacionais, S.A.*

VODAFONE PORTUGAL - *Comunicações Pessoais, S.A.*

# Appendix V

The engineers represent the following companies:

**CONVEX - Informática e Sistemas de Comunicações de Portugal, Lda.**

Convex is a Consulting and Integration Systems company that offers services in the areas of Information Technology, and Voice and Data Communications. At the moment, Convex has approximately 170 workers and 20 years of experience in mobile networks, information systems, and application software markets. Internationally, Convex is a part of the SATEC group, the biggest IT group in the Iberian Peninsula.

**Ericsson Telecommunications**

Ericsson Telecommunications is a multinational corporation scattered throughout the world with more than 250 employees. It has been a part of the Portuguese economy since 1953, covering essentially such areas as corporate communications, supplying the GSM system to *Telecel* or introducing first, second, and third generation mobile phones to the world. This event was the turning point of the rapid development that placed Ericsson at the top of the telecommunications market leaders in Portugal. Ericsson has made a great contribution to the Portuguese economy and the development of the Information Society.

***F. Fonseca, S.A.***

*F. Fonseca* is located in Aveiro and it has less than 50 employees. Its main activity is the import and the distribution of various electric and electronic components and equipment. It is the main representative in Portugal of prestigious manufacturers in diverse areas, such as electronic equipment for industrial automation, process control and measurement equipment, equipment that analyses and manages thermal and electric energy, monitoring atmospheric pollution equipment, home automation and intelligent solutions.

***HFA – Henrique, Fernando e Alves, Lda.***

This company has less than 50 workers and its main activity is the production, assembly and testing of electronic and telecommunications equipment, according to customers' requests. HFA provides the following assembly services: Telecommunications, Industrial Electronics, Automobile Industry, and Consumer Electronics.

**Huawei Technologies**

Huawei Technologies is a worldwide leader in providing next generation telecommunications networks. Currently, Huawei has over 100 employees in Portugal and has become one of the major suppliers of Portugal Telecom, Sonaecom, and Vodafone Portugal. A rich variety of Huawei's products such as UMTS, CDMA, NGN, IP DSLAM, Optical Network, Intelligent Network, Ring Back Tone and Terminals have been widely deployed in Portugal. Huawei expects to establish further partnerships with telecom operators in order to continue to strengthen its foundations in Europe.

***Grupo Portugal Telecom***

*Grupo Portugal Telecom* is the national leader of telecommunications in every sector it operates. It is the Portuguese multinational corporation with the greatest national and international projection, and it provides a diverse portfolio of business sectors, where quality and innovation are the main objectives, making it one of the most highly developed corporations of its sector.

The corporation's activities deal with every segment of the telecommunications sector: analogue and mobile business, multimedia, corporate data and solutions. These services are available in Portugal, Brazil and developing international markets, like Morocco, Guinea – Bissau, Cape Verde, Mozambique, East Timor, Angola, Kenya, China, São Tome and Principe, and Namibia.

***PT Compras - Serviços de Consultoria e Negociação, S.A.***

During the past few years, the importance of the acquisition of products and services has visibly increased for *Grupo Portugal Telecom* due to the great number of resource transactions and the incidence of positive results. This has led to the need for a specific sector that deals with negotiation and purchase. This medium-sized company is today *PT Compras – Serviços de Consultoria e Negociação, S.A* and it has less than 250 employees. The products and services that are bought by the PT Group are organized into four sectors at PT Compras: Telecommunications Systems; Information Systems; Market Products and Services; Marketing and Publicity.

***PT Inovação, S.A.***

*PT Inovação*, S.A. aims to bring insight and knowledge to the PT Group in order to enhance it. Its main objective is to be the leader in the strategic areas of business developments of the PT companies. This corporation also promotes the innovation process of services, technologies and operations in order to:

- diffuse and preserve know-how that will guarantee competition in the Portuguese and international markets;

- develop and support the implementation of Services, Solutions and Systems that will satisfy the clients' needs and distinguish the *PT Corporations* in relation to their competitors;

- demonstrate new Services and Technology and then launch them in the market.

**Siemens IC**

The multinational corporation, Siemens IC, is the only market supplier that offers corporations and mobile operators a complete panoply of services, from a number of products to complex network infrastructures, as well as associated facilities. Siemens IC is a worldwide leader in innovation of convergence technologies, products and services for mobile, analogue and corporate networks. Some of the different areas Siemens IC is proficient in are: Automation and Drives; Industrial Solutions and Services; Siemens Building Technologies; Transportation; Medicine; Operators; Automation and Control; Communications; Energy; and Mobile Communications.

**Vodafone Portugal**

The Vodafone Group is the world's greatest mobile telecommunications multinational corporation. In Portugal, they are the second biggest operator in the Telecommunications market. They offer mobile and voice services as well as analogue and Internet communication services. Vodafone began its commercial activity on 18$^{th}$ October 1992 and immediately provided GSM mobile communications service to the general public by reaching, at the time, 57% of national territory and 83% of the national population. It was the first Portuguese operator to offer third Generation Wide Band services, i.e. High Speed Downlink Packet Access (HSDPA).

This multinational corporation was seen as the prime factor in the development of the Portuguese mobile market by causing a profound change in the mobile telecommunications scenario in the country.

# Appendix VI

**Students' Set of Questionnaires (Portuguese version)**

| **INQUÉRITO POR QUESTIONÁRIO** | | | |
|---|---|---|---|
| Título da Tese<br>"Um Estudo de Inglês para Fins Específicos na área de Engenharia Electrónica e de Telecomunicações" | | | |

(Opcional) (Opcional)

**NOME:** _____ **IDADE:** (Anos) _____

**CURSO:** _____ ANO DO CURSO QUE FREQUENTA ACTUALMENTE ○ 1º ○ 2º ○ 3º ○ 4º ○ 5º

- **Este questionário encontra - se dividido em 3 secções.**
- **Cada secção está identificada por uma letra (A,B,C) e um título.**
- **As instruções de preenchimento encontram - se escritas em itálico.**
- **No caso de querer reformular ou corrigir uma resposta, por favor deixe uma *indicação clara* relativa a essa mesma correcção.**

*Responda, por favor, às seguintes questões, colocando uma cruz no quadrado, e/ou por extenso no espaço reservado para esse fim.*

**A. Perfil**

**Percurso Académico**

**1. Quando começou a estudar Inglês?**

a) Infantário ☐

b) Escola do 1º ciclo (1º, 2º, 3, e 4º anos) ☐

c) Escola do 2º ciclo (5º ano) ☐

d) Escola do 3º ciclo (7º ano) ☐

e) Escola Secundária (10º ano) ☐

f) Universidade ☐

g) Não estudou ☐

h) Outro ☐

---

**2. Durante quantos anos estudou, ou ainda estuda Inglês?**

a) Entre 1-3 anos ☐

b) Entre 3-6 anos ☐

c) Entre 6-9 anos ☐

d) Entre 9-12 anos ☐

e) Mais de 12 anos ☐

f) Nunca estudou ☐

*Responda, por favor, às seguintes questões, colocando uma cruz no(s) quadrado(s), e/ou por extenso no espaço reservado para esse fim.*

**3. Onde estudou Inglês?**

a) Infantário ☐

b)Escola do 1º ciclo (1º, 2º, 3º e 4º anos) ☐

c) Escola do 2º ciclo (5ºe 6º anos) ☐

d) Escola do 3º ciclo (7º, 8º e 9º anos) ☐

e) Escola Secundária ( 10º, 11º e 12º anos) ☐

f) Escola Profissional (10º, 11º e 12º anos) ☐

g) Instituto de Formação Profissional ☐

h) Escola de Línguas ☐

i) Explicações ☐

j) País de língua inglesa ☐

k) Não estudou ☐

l) Outro ☐

---

**B. Uso da língua Inglesa em contextos específicos**

*Responda, por favor, às seguintes questões, colocando uma cruz no(s) quadrado(s), e/ou por extenso no espaço reservado para esse fim.*

**1. Em que disciplina(s) teve/tem necessita da língua Inglesa?**

a) Electrónica ☐

b) Sistemas Digitais ☐

c) Teoria de Sistemas ☐

d) Electrónica Teórica ☐

e) Propagação Guiada ☐

f) Electromagnetismo ☐

g) Processamento de Sinais ☐

h) Interfaces e Periféricos ☐

i) Sistemas Operativos ☐

j) Sistemas Distribuídos ☐

k) Sistemas de Controlo ☐

l) Sistemas de Telecomunicações ☐

m) Outra ☐

---

*Responda, por favor, à seguinte questão de acordo com a escala abaixo indicada:*

*1=muita frequência; 2= com frequência; 3= nem muita nem pouca frequência; 4=pouca frequência 5=nenhuma frequência*

**2. Com que frequência utiliza a língua inglesa para:**

a) ouvir ☐

b) escrever ☐

c) falar ☐

d) ler ☐

*Responda, por favor, às seguintes questões, colocando uma cruz nos quadrados, e/ou por extenso no espaço reservado para esse fim.*

**3. No que respeita à *oralidade*, em que contexto(s) utiliza a língua inglesa?**

a) Socialização ☐

b) Participação em reuniões, aulas, discussões, etc ☐

c) Participação em conferências e debates científicos ☐

d) Apresentação de projectos ☐

e) Facultar explicações sobre o funcionamento de máquinas ☐

f) Outro. ☐

**4. No que respeita à *escrita*, em que contexto(s) utiliza a língua inglesa ?**

a) Realização de relatórios ☐

b) Redacção de artigos/trabalhos científicos ☐

c) Correspondência (cartas formais ou informais e *correio electrónico)* ☐

d) Preenchimento de inquéritos/formulários. ☐

e) Outros. ☐

---

**5. Que tipo de texto é necessário *ler e interpretar* com mais frequência?**

a) Correspondência (cartas formais ou informais e *emails*) ☐

b) Manuais de instruções ☐

c) Avisos de máquinas ☐

d) Bibliografia científica (livros, artigos, catálogos, revistas, etc.) ☐

e) Protocolos ☐

f) Manuais de *software* ☐

g) *Sites* da Internet ☐

h) Folhetos Informativos ☐

i) Questionários e Formulários ☐

j) Outro ☐

_____

**6. Hierarquize cada uma das seguintes competências de Inglês em função daquilo que um aluno do curso de EET deverá ser capaz de realizar de acordo com a seguinte escala:**

*1 = muito importante; 2 = importante; 3 = útil; 4 = pouco importante; 5=nada importante*

a) Ler e compreender textos escritos de natureza técnica ☐

b) Ler e compreender manuais de *software* informático ☐

c) Ler e compreender instruções de máquinas ☐

d) Compreender o funcionamento da gramática inglesa ☐

e) Redigir textos de natureza científica ☐

f) Fazer apresentações de projectos ☐

g) Socializar com indivíduos de outras culturas ☐

h) Dominar os termos técnicos da área de Telecomunicações ☐

i) Compreender instruções orais ☐

j) Compreender instruções escritas ☐

k) Participar em (vídeo) conferências ☐

l) Consultar fontes de informação especializada na Internet ☐

n) Compreender uma aula leccionada em Inglês ☐

o) Outra ☐

_____
_____

**C. Considerações Gerais**

*Responda, por favor, às seguintes questões tendo como base a sua experiência.*

**1. Considera que o Inglês específico da sua área de especialização, ou seja Telecomunicações, pode melhorar o seu desempenho como aluno do curso de EET?**

a) Sim. _____ b) Não. _____

Porquê? _____

*Responda, por favor, à seguinte questão de acordo com a escala abaixo indicada:*

**2. Em geral, em que medida está satisfeito/a com o seu nível de Inglês?**

| ***Muito satisfeito*** | ***Satisfeito*** | ***Nem satisfeito nem insatisfeito*** | ***Insatisfeito*** | ***Muito insatisfeito*** |
|---|---|---|---|---|
| | | | | |

Porquê? _____
_____

**3. Numa perspectiva de aprendizagem ao longo da vida, como penso dar seguimento à sua aprendizagem do Inglês?**

_____
_____

***Agradeço a sua colaboração,***

***FIM.*** ***Heidy Gonçalves***

**Students' Set of Questionnaires (English version)**

| **QUESTIONNAIRE** | | | |
|---|---|---|---|
| Dissertation Title<br>"Exploring English for Specific Purposes in Electronic Engineering and Telecommunications" | | | |

(Optional) (Optional)

**NAME:** _____ **AGE:** _____

**COURSE:** _____ YEAR ○ 1º ○ 2º ○ 3º ○ 4º ○ 5º

- **This questionnaire is divided in 3 parts.**
- **Each part is identified by a letter (A, B, C) and a title.**
- **The instructions are written in *Italic.***
- **If you would like to change or correct an answer, please indicate it clearly next to the question.**

*Please answer the following questions by placing X in the box and/or writing the answer on the line.*

**A. Profile**

**Academic Information**

**1. When did you start studying English?**

a) Kindergarten ☐

b) Primary school (1st, 2nd, 3rd and 4th grades) ☐

c) Primary school (5th grade) ☐

d) Middle school (7th grade) ☐

e) Secondary school (10th grade) ☐

f) University ☐

g) Never ☐

h) Other(s) ☐

---

**2. How many years did you study English?**

a) 1-3 years ☐

b) 3-6 years ☐

c) 6-9 years ☐

d) 9-12 years ☐

e) 12 + years ☐

f) Never ☐

*Please answer the following questions by placing X in the boxes and/or writing the answer on the line.*

**3. Where did you study English?**

a) Kindergarten ☐

b) Elementary School (1st, 2nd, 3rd and 4th grades) ☐

c) Elementary School (5th and 6th grades) ☐

d) Middle School (7th, 8th and 9th grades) ☐

e) High School (10th, 11th and 12th grades) ☐

f) Vocational School (10th, 11th and 12th grades) ☐

g) *Instituto de Formação Profissional* ☐

h) Language School ☐

i) Tutoring ☐

j) English-speaking country ☐

k) Never studied English ☐

l) Other(s) ☐

---

**B. Use of English language in specific contexts**

*Please answer the following questions by placing X in the boxes and/or writing the answer on the line.*

**1. In which subjects did you need or still need English?**

a) Electronics ☐

b) Digital Systems ☐

c) Systems Theory ☐

d) Electronics Theory ☐

e) Guided Propagation ☐

f) Electromagnetism ☐

g) Signal Processing ☐

h) Interfaces e Peripherals ☐

i) Operative Systems ☐

j) Distributed Systems ☐

k) Control Systems ☐

l) Telecommunications Systems ☐

m) Other(s) ☐

---

*Please answer the following question according to the scale below:*

*1=very frequently; 2= frequently; 3= not frequently; 4= rarely; 5= never*

**2. How frequently do you use the English language to:**

a) listen ☐

b) write ☐

c) speak ☐

d) read ☐

*Please answer the following questions by placing X in the boxes and/or writing the answer on the line.*

**3. In relation to *speaking*, in which contexts do you use the English language?**

a) Socialising ☐

b) Participating in meetings, classes, discussions, etc. ☐

c) Participating in conferences and scientific debates ☐

d) Presenting projects ☐

e) Explaining machine performance ☐

f) Other(s) ☐

_____

**4. In terms of *writing*, in which contexts do you use the English language?**

a) Reports ☐

b) Scientific articles and papers ☐

c) Correspondence (e-mails, formal and informal letters) ☐

d) Questionnaires and Forms ☐

e) Other(s) ☐

_____

**5. What type of text do you have to *read and interpret* more frequently?**

a) Correspondence (emails, formal and informal letters) ☐

b) Instruction Manuals ☐

c) Machine Warnings ☐

d) Scientific Bibliography (books, articles, catalogues, magazines, etc.) ☐

e) Protocols ☐

f) Software manuals ☐

g) Internet Sites ☐

h) Informative Pamphlets ☐

i) Questionnaires and Forms ☐

j) Other(s) ☐

_____

**6. According to the scale, order each of the following English language skills in terms of what an Electronics Engineering student should be able to achieve in English:**

*1=very important; 2= important; 3=not important; 4=not very important; 5=not important* at all

a) Reading and understanding scientific documentation ☐

b) Reading and understanding software and IT manuals ☐

c) Reading and understanding machine instructions ☐

d) Understanding the English grammar ☐

e) Writing scientific texts ☐

f) Presenting projects ☐

g) Socialising with people from different cultures ☐

h) Using technical terms in the area of Telecommunications ☐

i) Understanding oral instructions ☐

j) Understanding written instructions ☐

k) Participating in conferences ☐

l) Searching for specific information on the Internet ☐

m) Understanding a class taught in English ☐

n) Other contexts ☐

_____

**C. General Considerations**

*Please answer the following questions based on your experience.*

**1. Do you think English for Specific Purposes for Telecommunications can improve your work as an EET student?**

a) Yes. _____ b) No. _____

Why?_____

*Please answer the following questions according to the scale below.*

**2. In general, are you satisfied with your English level?**

| ***Very satisfied*** | ***Satisfied*** | ***Not very satisfied*** | ***Dissatisfied*** | ***Very dissatisfied*** |
|---|---|---|---|---|
| | | | | |

Why? _____

**3. In a life – long learning perspective, how do you intend to continue your English language learning?**

_____
_____

***Thank you.*** ***Heidy Gonçalves***

# Appendix VII

**Engineers' Set of Questionnaires (Portuguese version)**

| **INQUÉRITO POR QUESTIONÁRIO** | | | |
|---|---|---|---|
| Título da Dissertação<br>"Um Estudo de Inglês para Fins Específicos na área de Engenharia Electrónica e de Telecomunicações" | | | |

(Opcional)

**NOME:** **IDADE:** (Anos)

**EMPRESA**

- **Este questionário encontra - se dividido em 3 secções.**
- **Cada secção está identificada por uma letra (A,B,C) e um título.**
- **As instruções de preenchimento encontram -se escritas em itálico.**
- **No caso de querer reformular ou corrigir uma resposta, por favor deixe uma *indicação clara* relativa a essa mesma correcção.**

*Responda, por favor, às seguintes questões, colocando uma cruz no quadrado, e/ou por extenso no espaço reservado para esse fim.*

**A. Contextualização Profissional**

**1. Em que ramo da indústria é que a sua empresa se insere?**

._____

_____

**2. Quantos funcionários é que a sua empresa emprega?**

a) < 10 ☐

b) < 50 ☐

c) < 250 ☐

e) > 250 ☐

**3. Qual é o cargo que desempenha na empresa?**

a) Cargo de chefia. _____

Qual? _____

b)Outro. _____ Qual?_____

**B. Uso da língua Inglesa em contextos específicos**

**1. Com que frequência utiliza a língua inglesa no contexto de trabalho?**

*Responda, por favor, às seguintes questões de acordo com a escala abaixo indicada.*

*1= com muita frequência; 2= frequentemente; 3=raramente; 4=nunca*

a) ouvir ☐

b) ler ☐

c) falar ☐

c) escrever ☐

**2. No que respeita à *oralidade*, em que contexto(s) utiliza a língua inglesa?**

a) Contactos telefónicos ☐

b) Participação em reuniões

, conferências e vídeo – conferências ☐

c) Participação em feiras e congressos para a apresentação de

produtos e prospecção de clientes ☐

d) Participação em feiras e congressos para recolha de

informações e estabelecimento de contactos informais ☐

e) Resolução de problemas de ordem técnica com outros

funcionários dentro da mesma empresa ☐

f) Resolução de problemas de natureza técnica com

funcionários de outras empresas ☐

g) Dar formação profissional ☐

h) Facultar explicações sobre o funcionamento de máquinas ☐

i) Facultar explicações sobre de condições de trabalho ☐

j) Participar na resolução de problemas interpessoais ☐

k) Realizar de entrevistas ☐

l) Socializar com pessoas de culturas diferentes ☐

m) Realizar discursos ☐

n) Outro ☐

---

**3. No que respeita à *escrit*a, em que contexto(s) utiliza a língua inglesa ?**

**Na redaccção de:**

a) Relatórios ☐

b) Preenchimento de formulários de requisição de material ☐

c) Correspondência (cartas formais, informais e correio electrónico) ☐

d) Avisos ☐

e) Ordem de trabalhos ☐

f) Panfletos instrutivos ☐

g) Discursos ☐

h) Regulamentos ☐

i) Documentos promocionais ☐

j) Notas e Apontamentos ☐

k)Outros ☐

_____

**4. Que tipo de texto é necessário *ler e interpretar* com mais frequência?**

a) Correspondência (cartas formais e informais, e correio electrónico) ☐

b) Manuais de instruções ☐

c) Mensagens de máquinas ☐

d) Catálogos ☐

e) Bibliografia científica (livros, artigos, catálogos, revistas) ☐

f) Manuais de software ☐

g) Protocolos ☐

h) *Sites* de Internet___ ☐

i) Ordem de Trabalhos ☐

j) Contratos ☐

k) Avisos ☐

l) Rótulos ☐

m) Agendas ☐

n) Outros ☐

_____

**5. Hierarquize cada uma das seguintes competências de Inglês em função daquilo que um aluno do curso de EET deverá ser capaz de no dia a dia, de acordo com a seguinte escala:**

***1 = indispensável; 2 = muito importante; 3 = importante; 4 = útil;5 = nada i importante***

a) Ler e compreender textos escritos de natureza técnica ☐

b) Ler e compreender manuais de software informático ☐

c) Ler e compreender instruções de máquinas ☐

d) Participar em reuniões e (vídeo) conferências ☐

e) Interagir com indivíduos de outras culturas. ☐

f) Compreender a gramática inglesa ☐

g) Manter um diálogo sobre a empresa para a qual trabalha

h) Dar informações pelo telefone ☐

i) Redigir textos de natureza administrativa ☐

j) Dominar os termos técnicos da área na qual se encontra a trabalhar. ☐

k) Compreender instruções orais ☐

l) Compreender instruções escritas ☐

m) Explicar o funcionamento de uma máquina ☐

n) Consultar fontes de informação especializada na Internet. ☐

o) Outra. ☐

---

**C. Considerações Gerais**

*Responda, por favor, às seguintes questões tendo por base a sua experiência.*

**1. Considera que a aprendizagem do Inglês constitui uma componente importante na formação dos Engenheiros de Electrotecnia e de Telecomunicações?**

a) Sim_____ b) Não _____

Porquê?

_____

_____

_____

**2. Considera que o Inglês específico da área de Telecomunicações pode melhorar o seu desempenho e dos engenheiros na sua empresa?**

a)Sim _____ b) Não_____

Porquê? _____

*Responda, por favor, à seguinte questão de acordo com a escala abaixo indicada:*

**3. Em geral, em que medida está satisfeito/a com o seu nível de Inglês?**

| ***Muito satisfeito*** | ***Satisfeito*** | ***Nem satisfeito nem insatisfeito*** | ***Insatisfeito*** | ***Muito insatisfeito*** |
|---|---|---|---|---|
| | | | | |

Porquê? _____
_____

***Agradeço a sua colaboração,***

***FIM.*** ***Heidy Gonçalves***

**Engineers' Set of Questionnaires (English version)**

| **QUESTIONNAIRE** | | | | |
|---|---|---|---|---|
| **Title of Dissertation**<br>"Exploring English for Specific Purposes in Electronic Engineering and Telecommunications" | | | | |
| | | | | |
| **NAME:**<br>(Optional) | | **AGE** | 25 - 43 | |
| | | | 44 - 55 | |
| | | | 56+ | |
| **COMPANY:** | | | | |
| **COURSE** | | | | |

## A. Profile

- **This questionnaire is divided in 3 parts.**
- **Each part is identified by a letter (A, B, C) and a title.**
- **The instructions are written in *Italic.***
- **If you would like to change or correct an answer, please indicate it clearly next to the question.**

**1. What type of company do you work for?**

._____

_____

**2. How many workers are there?**

a) < 10 ☐

b) < 50 ☐

c) < 250 ☐

d) > 250 ☐

**3. What is your job post?**

a) Head position. _____

Which? _____

b)Others. _____ Which?_____

**B. Use of English language in specific contexts**

*Please answer the following question according to the scale below:*

*1=very frequently; 2= frequently; 3=not frequently; 4= rarely; 5= never*

**1. How frequently do you use the English language to:**

**a) listen** ☐

**b) write** ☐

**c) speak** ☐

**c) read** ☐

*Please answer the following questions by placing X in the boxes and/or writing the answer on the line.*

**2. In relation to *speaking,* in which contexts do you use the English language?**

a) Telephone conversation ☐

b) Participating in meetings and (video) conferences, etc. ☐

c) Participating in trade/industry exhibitions and congresses to present products and carry out client prospecting ☐

d) Participating in exhibitions and congresses to gather information and establish informal contacts ☐

e) Solving technical problems with fellow workers in the same company ☐

f) Solving technical problems with workers from other companies ☐

g) Providing vocational training ☐

h) Giving technical instructions about machines ☐

i) Providing information on the working conditions inside a company ☐

j) Participating in the solution of interpersonal problems ☐

k) Job interviewing ☐

l) Socialising with people from different cultures ☐

m) Giving speeches ☐

n) Other contexts ☐

---

**3. In terms of *writing*, in which contexts do you use the English language?**

a) Reports ☐

b) Forms ☐

c) Correspondence (formal and informal letters, e-mails, etc.) ☐

d) Notices and/or Circular letters ☐

e) Work agenda ☐

f) Informative Pamphlets ☐

g) Speeches ☐

h) Rules and regulations ☐

i) Promotional documents ☐

j) Notes ☐

k) Other genres ☐

---

**4. What type of text do you have to *read and interpret* more frequently?**

a) Correspondence (formal and informal letters, e-mails, etc.) ☐

b) Instruction manuals ☐

c) Machine warnings ☐

d) Catalogues ☐

e) Scientific Bibliography (books, articles, catalogues, magazines, etc.) ☐

f) Software manuals ☐

g) Protocols ☐

h) Internet sites ☐

i) Work Agenda ☐

j) Contracts ☐

k) Notices or/and Circular letters ☐

l) Labels ☐

m) Agendas ☐

n) Other genres ☐

---

**5. According to the scale, order each of the following English language skills in terms of what an Electronics Engineer should be able to achieve in English:**

*1=very important; 2= important; 3=not important; 4=not very important; 5=not important* at all

a) Reading and understanding technical documentation ☐

b) Reading and understanding software and IT manuals ☐

c) Reading and understanding machine instructions ☐

d) Participating in meetings or (video) conferences ☐

e) Socialising with people of different cultures ☐

f) Understanding and using the English grammar ☐

g) Speaking about the company you work for ☐

h) Giving information over the telephone ☐

i) Writing administrative texts ☐

j)Understanding and using the technical terms in

the area of Telecommunications ☐

k) Understanding oral instructions ☐

l) Understanding written instructions ☐

m) Providing spoken and written information on operating machines ☐

n) Searching for specialized sources of information on the Internet ☐

o) Other skills and competences ☐

---

**C. General Considerations**

*Please answer the following questions based on your experience.*

**1. Do you think English for Specific Purposes for Telecommunications is important in Electronics engineers' academic profile?**

a) Yes _____ b) No _____

Why/Why not?

_____

_____

**2. Is English for Specific Purposes important in selecting an engineer for a future job post? Why?**

_____

*Please answer the following question according to the scale below.*

**3. In general, are you satisfied with your level of English ?**

| ***Very satisfied*** | ***Satisfied*** | ***Not very satisfied*** | ***Dissatisfied*** | ***Very dissatisfied*** |
|---|---|---|---|---|
| | | | | |

Why? _____

***Thank you.*** ***Heidy Gonçalves***

# Appendix VIII

**Professors' Set of Questionnaires (Portuguese version)**

<table>
<tr><td colspan="5">INQUÉRITO POR QUESTIONÁRIO</td><td></td><td></td><td></td></tr>
<tr><td colspan="8">Título da Dissertação<br>"Um Estudo de Inglês para Fins Específicos na área de Engenharia Electrónica e de Telecomunicações"</td></tr>
<tr><td colspan="8">(Anos)</td></tr>
<tr><td>NOME:<br>(Opcional)</td><td colspan="4"></td><td rowspan="3">IDADE</td><td>25 - 43</td><td></td></tr>
<tr><td colspan="4" rowspan="2"></td><td>44 - 55</td><td></td></tr>
<tr><td>+56</td><td></td></tr>
<tr><td>DISCIPLINA LECCIONADA:</td><td colspan="7"></td></tr>
<tr><td rowspan="4">EXPERIÊNCIA DE ENSINO:</td><td>5 – 10 (anos)</td><td></td><td colspan="5" rowspan="4"></td></tr>
<tr><td>10-20</td><td></td></tr>
<tr><td>20 - 30</td><td></td></tr>
<tr><td>+ 30</td><td></td></tr>
</table>

**• As instruções de preenchimento encontram-se escritas em itálico.**

**• No caso de querer reformular ou corrigir uma resposta, por favor deixe uma *indicação clara* relativa a essa mesma correcção.**

**A. Considerações Gerais**

*Responda, por favor, às seguintes questões, colocando uma cruz no(s) quadrado(s), e/ou por extenso no espaço reservado para esse fim.*

**1. Considera que a aprendizagem do Inglês constitui uma componente importante na formação dos Engenheiros de Electrotecnia na área de Telecomunicações?**

| ***Muito importante*** | ***Importante*** | ***Nem muito nem pouco importante*** | ***Pouco importante*** | ***Nada importante*** |
|---|---|---|---|---|
| | | | | |

Justifique a sua resposta.

_____
_____

*Responda, por favor, às seguintes questões tendo como base a sua experiência.*

**2. Considera que o Inglês para fins específicos na área de Telecomunicações pode melhorar o desempenho dos alunos durante a sua formação?**

a)Sim. _____ b) Não_____

Porquê? _____
_____

**E dos futuros engenheiros na sua prestação profissional?**

a)Sim. _____ ..Não _____

..Porquê? _____
_____

*Responda, por favor, às seguintes questões, colocando uma cruz no(s) quadrado(s), e/ou por extenso no espaço reservado para esse fim.*

**3. Que situações de comunicação profissional poderão ser melhoradas/optimizadas com o contributo do Inglês na área da EET?**

a) Leccionar ☐

b) Ler e compreender textos escritos de natureza técnica ☐

c) Ler e compreender manuais de *software* informático ☐

d) Ler e compreender instruções de máquinas ☐

e) Participar em reuniões, congressos, palestras, etc. ☐

f) Socializar com indivíduos de outras culturas ☐

g) Dar informações pelo telefone ☐

h) Dominar os termos técnicos da área na qual se encontra a trabalhar ☐

i) Compreender instruções orais ☐

j) Compreender instruções escritas ☐

k) Escrever bibliografia científica (artigos, relatórios, etc.) ☐

l) Outra ☐

Porquê? _____

*Responda, por favor, às seguintes questões de acordo com a escala abaixo indicada.*

**4. Com que grau de confiança encara as seguintes situações comunicacionais em Inglês?**

***1 = total confiança; 2 = muita confiança; 3 = com confiança; 4 = pouca confiança; 5 = nenhuma confiança***

a) Realizar contactos telefónicos ☐

b) Participar em reuniões ☐

c) Participar oralmente em congressos, conferências, vídeo - conferências e palestras, etc. ☐

d) Resolver problemas de ordem técnica ☐

e) Leccionar numa universidade no estrangeiro. ☐

f) Facultar explicações sobre o funcionamento de máquinas. ☐

g) Participar na resolução de problemas interpessoais. ☐

h) Escrever artigos/relatórios científicos. ☐

i) Preencher formulários de requisição de material. ☐

j) Correspondência (memorandos, cartas formais, informais, *e-mails*, faxes). ☐

k) Socializar com indivíduos de outras culturas. ☐

l) Contactar com a comunidade académica internacional ☐

m) Dar informações pelo telefone. ☐

n) Aplicar os termos técnicos da área na qual se encontra a trabalhar. ☐

o) Outra. ☐

---

***Agradeço a sua colaboração,***

***FIM.*** ***Heidy Gonçalves***

**Professors' Set of Questionnaires (English version)**

| **QUESTIONNAIRE** | | | | | |
|---|---|---|---|---|---|
| Dissertation Title<br>"Exploring English for Specific Purposes in Electronic Engineering and Telecommunications" | | | | | |
| (Optional) | | | | | |
| **NAME:**<br>(Opcional) | | | **AGE** | 25 - 43 | |
| | | | | 44 - 55 | |
| | | | | 56+ | |
| **SUBJECT TAUGHT:** | | | | | |
| **TEACHING EXPERIENCE:** | 5– 10 (years) | | | | |
| | 10-20 | | | | |
| | 20 - 30 | | | | |
| | 30 + | | | | |

**• The instructions are written in *Italic.***

**• If you would like to rewrite or correct any given answer, please clearly identify the correction.**

*Please answer the following questions by writing an X in the appropriate box, or write your answers on the line.*

**1. According to the following scale, do you think English is important for an Electronics Engineering and Telecommunications student?**

| *Very important* | ***I**mportant* | *Not very important* | *Not important* | *Not important at all* |
|---|---|---|---|---|
| | | | | |

Justify your answer.

_____
_____

*Please answer the following questions according to your experience.*

**2. Do you think English for Specific Purposes for Telecommunications can improve students' performance during their academic years?**

a)Yes. _____ b) No. _____

Why/Why not?

_____
_____

**And future engineers' performance in a professional context?**

a)Yes. _____ b) No. _____

Why/Why not?

_____
_____

*Please answer the following questions by writing an X in the appropriate box(es), or write your answers on the line.*

**3. Which professional communicative contexts can be enhanced with the help of ESP in the area of Electronics Engineering and Telecommunications?**

a) Teaching ☐

b) Reading and Understanding technical documentation ☐

c) Reading and Understanding software manuals ☐

d) Reading and Understanding machine instructions ☐

e) Participating in (video) conferences ☐

f) Socialising with people from different cultures ☐

g) Giving information over the telephone ☐

h) Using technical terms in the area of Telecommunications ☐

i) Understanding oral instructions ☐

j) Understanding written instructions ☐

k) Writing scientific documents (articles, papers, reports, etc.) ☐

l) Other contexts ☐

Why? _____

*Please answer the following question according to the scale.*

**4. How confidently do you face the following communicative contexts in English?**

*1=total confidence; 2= a lot of confidence; 3=with confidence; 4=little confidence; 5=no confidence*

a) Telephone speech ☐

b) Participating in meetings ☐

c) Participating in (video) conferences ☐

d) Solving technical problems ☐

e Teaching at a foreign university ☐

f) Giving technical instructions about machines ☐

g) Participating in the solution of interpersonal problems ☐

h) Writing scientific documentation (articles, papers, reports, etc.) ☐

i) Filling out forms to request new equipment ☐

j) Correspondence (e-mails, formal and informal letters) ☐

k) Socialising with people from different cultures ☐

l) Contacting the international academic community ☐

m) Providing information over the telephone ☐

n) Using technical terms in the area of Telecommunications ☐

o) Other skills and competences ☐

_____

_____

***Thank you.*** ***Heidy Gonçalves***